

THE MARINE RECORD

ESTABLISHED 1878

VOL XIX. NO. 8.

CLEVELAND, OHIO, FEBRUARY 20, 1896.

\$2 PER YEAR. 10c. SINGLE COPY.

SHIP BUILDING AND REPAIRS.

LAUNCH OF THE NEW MUTUAL STEAMER.

The launch of the new Mutual steamship will occur at the Globe shipyard next Saturday afternoon. No name for her has yet been decided upon and she may go into the water without christening, as President L. C. Hanna, of the Mutual Transportation Co., is in Europe, and his wishes will likely be consulted. This ship, which when afloat, will bear the oft relinquished honor of "the largest on the lakes," and the longitudinal elevation, presented this week, will show to advantage some of the especial features of her construction. The builders designed her with an especial view to great strength, and nothing was sacrificed in the interest of great cargo records. She is 432 feet long over all, 412 feet between perpendiculars, by 48 feet beam and 28 feet depth. Her water bottom is of the cellular type, and is 60 in. deep. The frames are of Z bars $6\frac{1}{2} \times 3\frac{1}{2}$ in. spaced two feet apart, with web frames as shown in the drawing. The stanchions are I beams, the main deck beams, channels and the upper deck beams bulb Tees, the latter being only 4 feet apart, instead of 8 feet

She will have triple-expansion surface-condensing engines, with cylinders 21 $\frac{1}{2}$, 34 and 57 inches by 39 inches stroke of piston. Her two boilers will be 13 $\frac{1}{4}$ feet in diameter by 9 $\frac{1}{4}$ feet long, allowed 180 pounds steam pressure, and the steamer is expected to make 14 miles an hour loaded. Her capacity will be 2,000 tons on 14 feet draft. She will have three spars and a partial outfit of canvas. The officers' quarters will be finished in mahogany and walnut and furnished with hot and cold water.

A CHANGE OF BASE.

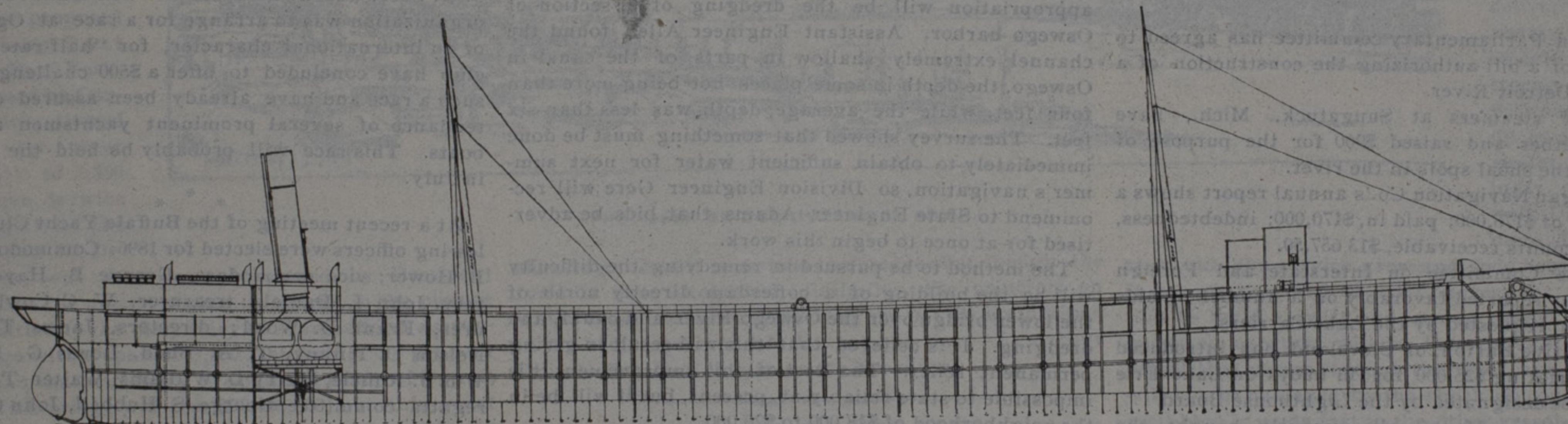
The well-known dry-dock and shipbuilding firm of Reiboldt, Wolter & Co., of Sheboygan, Wis., has decided to change its location to Sturgeon Bay. The citizens of the latter port will give a bonus of \$6,000 and furnish a site with 800 feet frontage on Sturgeon Bay. This company guarantees to remain there at least ten years, otherwise site and bonus revert to the donors.

Messrs. August Reiboldt and Joseph Wolter have been associated as shipbuilders at Sheboygan for ten years, during which period they have built 33 vessels of all sizes, the largest being the steamer Helena, measuring 2,083 tons gross. They now own a floating dry-dock,

WANT BETTER PRICES FOR COAL.

General Manager Hays, of the Grand Trunk Railway, of Canada, has thrown out all the bids for furnishing 430,000 tons of coal for the use of this company. This was because of a uniform advance in the prices named in the bids as compared with last year. This was due to a general feeling among the producers that better prices must be obtained for bituminous coal than have been ruling. There was no indication of a combine on this particular contract save that the bids hovered very close to \$1.75 per ton. This is not an excessive figure, considering the advanced wages paid to miners and that the freight rate on coal from the mines to the bridge over Niagara River is fixed for this year at \$1.15.

The indications are that coal men will unite in demanding better prices for their coal, as the lake freights are sure to be higher next season than the contract rates for last year. Indeed, it seems that the vessel men will probably be shy of contracting at all, owing to the large losses some of them sustained last year by contracting at low figures. The winter has been comparatively mild in the Northwest, but coal is leaving the docks steadily and at a rate which will insure clean



LONGITUDINAL SECTION OF THE NEW MUTUAL LINER.

apart, as in most vessels now built. The material is of the best open-hearth steel.

The engines are of the Globe inverted cylinder, triple-expansion type, with cylinders 23, 39, and 63 by 42 inches. The four Scotch-type boilers, 11 $\frac{1}{2}$ feet in diameter by 10 feet in length, are placed in two pairs, athwartship, as shown in the drawing. The main deck is laid as far forward as the after spar, and on this are the coal bunkers. The two after hatchways are for fuel as well as cargo, the fuel being supplied after the cargo is loaded and the main deck hatches put down. The fuel over and around the main deck hatches is burned first, allowing access to the hold, and the fuel on the sides is left for the return trip. The ship has thirteen hatchways in all. The new boat will be commanded by Capt. William Cummings, with Mr. Andrew Haig as chief engineer.

WILL BE BUILT ON THE TYNE.

Captain Gaskin and two directors of the Montreal Transportation Co., have returned to Kingston, Ont., after awarding the contract for a new steamer for their line. She is to be built on the Tyne, just above Newcastle, and will be named the Rosemont. She will be 253 feet long over all and 245 feet between perpendiculars, with 41 feet beam and 24 $\frac{1}{4}$ feet moulded depth.

and will remove it to Sturgeon Bay early next May, enlarging it so as to accommodate vessels 250 feet long. Work is to be begun as soon as practical at excavating a dock in the solid rock, and this will be pushed to completion with a haste which will depend somewhat upon the demands of business.

THE STEEL CANAL BARGES.

General Manager Charles E. Wheeler of the Cleveland Steel Canalboat Co., returned from the East Monday. Four of the ten tow barges which are building for this company at the Crescent shipyard, at Elizabeth, N. J., are so far along that they will be put into the water before the end of the month. The ten barges will be rushed to the launching stage before the construction of the three steamers begins. These steamers will be furnished with Roberts Safety Water-Tube Boilers, which will furnish steam sufficient to exert 250 horsepower.

THE NEW HURON TUG.

The Ship Owners' Dry-dock Co., have made all the molds and are almost ready to lay the keel of the new tug which they will build for Joseph Dewhurst, of Vermillion. This tug is to be 82 feet long over all and 75 feet on the keel, with 19 feet beam, and 10 feet depth.

(CONTINUED ON PAGE 7.)

docks by the time coal can arrive by lake. At Duluth and Superior the total movement from the docks was 9,047 cars, or about 225,000 tons for January, a considerable falling off as compared with December and November.

Sales of coal in the Northwest will begin very soon, and, it is rumored that an important meeting of producers will be held before the month is over with a view to reaching some definite understanding. The general results of last year's business were anything but satisfactory, and self protection now demands that the extent to which competition has been carried in the past should by some means be curtailed. An advance just now, if not too great as compared with last year, would, it is believed, have a tendency to hasten sales.

RETIREMENT OF CAPTAIN SWAIN.

Capt. Martin Swain has retired from the command of the wrecking tug Favorite. His health has not been as good as he could wish, and his retirement at the age of 57 years is chiefly to take treatment for an internal ailment. He retains his interest in the Swain Wrecking Co. He is succeeded in command of the Favorite by Capt. P. L. Millen. Capt. Swain has been in the tugging and wrecking business for many years and has been on the Favorite for six seasons.

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

PRESIDENT.

J. J. H. BROWN, Buffalo, N. Y.

VICE PRESIDENTS.

H. H. Brown, Cleveland. C. A. Eddy, Bay City. J. W. Millen, Detroit. G. G. Hadley, Toledo. W. P. Henry, Buffalo. James McBrier, Erie. J. G. Kent, Chicago. Conrad Starke, Milwaukee. G. A. Tomlinson, Duluth. F. J. Firth, Philadelphia. Frank Owen, Ogdensburg.

SECRETARY.

CHARLES H. KEEF, Buffalo, N. Y.

TREASURER.

GEORGE P. MCKAY, Cleveland, O.

COUNSEL.

HARVEY D. GOULDER, Cleveland, O.

COMMITTEE ON FINANCE.

H. M. Hanna, Cleveland.	D. C. Whitney, Detroit.
H. H. Brown, Cleveland.	W. P. Henry, Buffalo.
James Corrigan, Cleveland.	J. J. H. Brown, Buffalo.
H. A. Hawgood, Cleveland.	David Vance, Milwaukee.
Thos. Wilson, Cleveland.	R. P. Fitzgerald, Milwaukee.
M. A. Bradley, Cleveland.	John G. Keith, Chicago.
J. C. Gilchrist, Cleveland.	J. S. Dunham, Chicago.
E. M. Peck, Detroit.	

COMMITTEE ON LEGISLATION.

S. D. Caldwell, Buffalo.	James Corrigan, Cleveland.
James Ash, Buffalo.	Wm. Livingston, Detroit.
E. T. Evans, Buffalo.	James Millen, Detroit.
P. P. Miller, Buffalo.	Jesse Spaulding, Chiego.
H. C. French, Buffalo.	C. A. Eddy, Bay City.
W. Bullard, Buffalo.	Alex. McDougall, Duluth.
Edward Smith, Buffalo.	F. J. Firth, Philadelphia.
H. M. Hanna, Cleveland.	

COMMITTEE ON AIDS TO NAVIGATION.

George P. McKay, Cleveland.	W. M. Egan, Chicago.
W. C. Richardson, Cleveland.	Frank Owen, Ogdensburg.
H. G. Dalton, Cleveland.	A. W. Colton, Toledo.
B. L. Pennington, Cleveland.	James Davidson, Bay City.
Thomas Wilson, Cleveland.	Alvin Neal, Port Huron.
John W. Moore, Cleveland.	M. M. Drake, Buffalo.
W. S. Mack, Cleveland.	W. Bullard, Buffalo.
David C. Carter, Detroit.	

FLOATSAM AND JETSAN.

Henderson Bros., of Glasgow, have laid the keel for a duplicate of the Valkyrie III.

A daily exchange informs the public that a certain new boat will have three spars, fitted out with sails and hatchways.

A Canadian Parliamentary committee has agreed to the passage of a bill authorizing the construction of a bridge over Detroit River.

Owners of steamers at Saugatuck, Mich., have clubbed together and raised \$900 for the purpose of digging out the shoal spots in the river.

The Michigan Navigation Co.'s annual report shows a capital stock of \$175,000; paid in, \$170,000; indebtedness, \$4,555.01; accounts receivable, \$13,657.50.

The House Committee on Interstate and Foreign Commerce has reported favorably on a number of aids to navigation, requested by the Lake Carriers.

Representative Burton, of Cleveland, has introduced a bill appropriating \$25,000 for 16 buoys on Lake Erie at points to be designated by the Lighthouse Board.

Captain William Moore, who recently bought the Maud Preston, will, it is said, operate her in the excursion business between Port Clinton and the Islands.

The Delaware River shipyard, at Chester, Pa., will build two more boats for the Brooklyn & New York Ferry Company, duplicates of three boats formerly built.

A New York State bill appropriating money for floating elevators at Buffalo and New York is meeting with opposition at the hands of the Lake Carriers' Association.

A large brick warehouse, 70 x 120 feet, will be built at the central wharf, foot of Madison street, Toledo, for the C. & B. boats. A fine reception room will be fitted up for passengers.

The House Committee on Railways and Canals voted unanimously to report favorably upon the bill appropriating \$150,000 for a deep waterway survey from the Great Lakes to the Atlantic Coast.

M. F. Davis, of Detroit, has invented a new oar for racing. It is in two parts, the blade being of wood and the handle inboard of steel tubing. The advantages claimed are greater power and more stroke on the reach.

A decree was made in the United States Court, at Grand Rapids, Wednesday, allowing damages to the amount of \$800, the value of the libeled vessel in the admiralty case of the steamer Cayuga vs. the J. L. Hurd. The former vessel was sunk in a collision and is

still under water, and the Hurd was recently sold for \$800.

The House Committee on Claims has reported favorably on Mr. Stephenson's bill reimbursing members of a surveying party on Chequamegon Bay, who lost their effects by the burning of the tug Mystic, September 27, 1893.

Prospects for extensive harbor work at West Michigan ports are not very encouraging. St. Joseph asked for \$1,000,000, and the Secretary of War recommended but \$30,000. Saugatuck and South Haven were modest, asking for only \$40,000, but they were trimmed down to \$10,000.

Adam Kiyoshk, the Indian diver employed on the wrecking steamer Favorite for several seasons, who is now spending the winter in Chicago, will locate in the Sault Ste. Marie next spring and will do diving business in partnership with Bert Stimson, another well-known diver.

Representative Burton has introduced a joint resolution directing the Secretary of War to cause a survey to be made of Starve Island Reef, located near Starve Island and South Bass Island, in Lake Erie, and to cause an estimate to be made of the cost of removing the rock thereon so as to leave a navigable channel 25 feet in depth over the reef, and appropriating \$1,000 to pay the cost of the survey and estimate. There is now only 11 feet of water over the reef, and it is exceedingly dangerous.

The Beauvais Boat and Canoe Company, of Charlevoix, Mich., lost a paint shop and warehouse by fire Sunday morning, and over \$2,000 worth of boats were burned. Several boats were saved, but the building was completely destroyed. There was no insurance. The steam yacht Lady Jane, owned by S. M. Moore, of Chicago, was on the ways adjoining and was badly scorched. There had been no fire in the building, and it was incendiarism or spontaneous combustion.

DREDGING AT OSWEGO.

The first work of importance to be done on the middle division of the New York canals under the \$9,000,000 appropriation will be the dredging of a section of Oswego harbor. Assistant Engineer Allen found the channel extremely shallow in parts of the canal in Oswego, the depth in some places not being more than four feet, while the average depth was less than six feet. The survey showed that something must be done immediately to obtain sufficient water for next summer's navigation, so Division Engineer Gere will recommend to State Engineer Adams that bids be advertised for at once to begin this work.

The method to be pursued in remedying the difficulty will be the building of a cofferdam directly north of the lower bridge over the Oswego River and canal, and dredging. It is believed that this will result in giving permanent relief. The cost of this improvement it is impossible to state reliably at present, but it will be in the neighborhood of \$18,000 to \$20,000.

The engineers who are engaged in making the survey along the middle division are progressing rapidly with their work, and it is believed that they will have finished by March 15, so that the work on the plans can be begun immediately afterward.

MORE ERIE CANAL LEGISLATION.

Senator Lamy has introduced in the New York Assembly two bills, one of which creates the position of deputy Superintendent of public works, and cuts down the time for which bids must be advertised for under the \$9,000,000 appropriation from 30 to 10 days. The other provides for a state levy of 12 of a mill in October, 1896, to be used for "extraordinary work on the canal," and appropriates \$500,000 for immediate use for "extraordinary repairs and improvements of existing mechanical and other constructions connected with the canals to facilitate the control and management of the canals by the introduction of electric communication between section superintendents, officers, and employees. The comptroller is authorized to borrow \$500,000 so that the same may be available before the tax is collected. This appropriation covers the repair fund, which usually amounts to \$750,000.

President Moxham and General Manager Suppes, of the Johnson Company, of Lorain, O., will build a \$40,000 foundry plant. Over 100 men will be employed.

YACHTS AND YACHTSMEN.

An enthusiastic meeting of the Inter-Lake Yachting Association was held at Detroit last Saturday evening. Delegates in attendance were, E. W. Radder, Cleveland; Frank Hower, Buffalo; George R. Williams, Sandusky; George T. Bliss, Erie; Frank R. Frey, Toledo Yacht Club, Toledo; S. H. Jones, Citizens' Yacht Club, B. Shulz, West End Yacht Club, and C. J. Lichtenberg, Detroit Yacht Club, all of Detroit.

Officers were elected as follows: George H. Worthington, Cleveland Yacht Club, commodore; C. J. Lichtenberg, Detroit Yacht Club, vice-commodore; Henry Tracy, Ohio Yacht Club, Toledo, rear commodore; George T. Bliss, Erie Yacht Club, Erie, fleet captain; Frank R. Frey, Toledo Yacht Club, Toledo, secretary-treasurer; Dr. George Duffield Steward, Citizens' Yacht Club, Detroit, surgeon; Joseph Hepburn, Toledo Yacht Club, measurer; Rollin Potter, Toledo Yacht Club, Captain Nicholson, Detroit Yacht Club, W. C. Bean, Citizens' Yacht Club, Detroit, Frank Hubbard, Sandusky Yacht Club, Sandusky; Past Commodore B. Shulz, West End Yacht Club, Detroit, members of regatta committee.

Proposed changes in the rules were discussed at length, but action was postponed to a future meeting. These changes all related to racing matters. Mr. Radder offered changes in classification, proposing that hereafter the excess of gaff top sails above the top masthead and beyond the outer end of the gaff should not be taxed. He also favored allowing boats in the three leading classes be allowed a cook, waiter, and two guests in addition to the crew. Mr. Hower offered an amendment providing that only the sail area should hereafter be measured.

* * *

Citizens of Ogdensburg have organized a yacht club with the following officers: Honorary president, E. A. Newell; commodore, S. G. Averell; vice-commodore, W. H. Post; secretary and treasurer, A. R. Porte; regatta committee, A. R. Porte. Hon. George Hall, Capt. Chapman, Capt. Lyon, J. G. Fraser; finance committee, E. A. Newell, E. L. Strong, Stanley W. Wilson, J. A. Seely and S. G. Averell. The main object of the organization was to arrange for a race at Ogdensburg of an international character, for "half-raters." The club have concluded to offer a \$500 challenge cup for such a race and have already been assured of the attendance of several prominent yachtsmen and their boats. This race will probably be held the first week in July.

* * *

At a recent meeting of the Buffalo Yacht Club the following officers were elected for 1896: Commodore, Frank B. Hower; vice commodore, George B. Hayes; secretary, John L. Daniels; treasurer, W. C. Cowles; measurer, Frank D. Wood; directors, James Thompson, Nelson O. Tiffany, T. A. Budd, Lewis G. Northrup, Wm. J. Runcie, Harry D. Williams, Walter T. Wilson; regatta committee, George S. Hubbell, John C. Gager, F. S. Thorne.

* * *

At the annual meeting of the Cleveland Yacht Club officers were chosen as follows: Commodore, G. H. Worthington; vice commodore, Percy W. Rice; rear commodore, P. P. Wright; secretary and treasurer, Bert G. Munhall; measurer, F. W. Radcliffe; assistant measurer, O. R. Carleton; surveyor, H. Richter; fleet surgeon, Dr. E. E. Beeman; directors for three years, B. D. Minshall, E. W. Radder, George H. Gardner, J. D. Cox, Jr.; directors for one year, W. R. Huntington, Percy W. Rice, P. P. Wright, and E. E. Beeman; regatta committee, P. P. Wright, G. H. Gardner, and W. R. Huntington. The members pledged \$500 for the purchase of a cup to be given for a race between schooner yachts off Cleveland.

* * *

Yachtsmen may be interested in the discovery of an Italian sea captain, George Batta Vasalio, of Genoa, that additional speed can be secured by making a number of small holes in the sails. The contention is that the force of the wind cannot fully take effect upon the sail, since the air in front of it cannot properly circulate in the inflated part; that is, it is stagnant and in effect a cushion, which acts like a spring mattress, decreasing the actual pressure of the wind against the canvas. Trials made by the captain in various weathers have seemingly proved the advantage of this innovation.

THE MARINE RECORD.

ARGUMENTS WHICH CAN NOT BE REFUTED.

General Counsel Harvey D. Goulder returned Wednesday from Chicago, where he has been continuing his investigations on the bridging and tunneling possibilities on Detroit River. Mr. John Nichol, who assisted Mr. Cheesborough in a preliminary survey at Detroit River several years ago, and Mr. George Chambers, the contractor, who bored a five-foot experimental tunnel under Detroit River, half-way across from the Detroit side, and one-fourth the distance across from the Canadian side, have both submitted statements to Mr. Goulder to the effect that they found the material to be first-class for tunnel work and that the problem presented no unusual difficulties.

Mr. S. G. Artingstall, formerly city engineer of Chicago, who has several times examined the Detroit River location, and who made an investigation, the results of which he reported to the Army Board sitting on the question in 1889, states that a tunnel is not only possible, but is the best and cheapest method of crossing the river. This he now reiterates to Mr. Goulder after making further investigations and estimates.

Mr. Goulder has also the details of three plans made by Mr. Cheesborough for tunneling the river from Amherstburg, via Stony Island, the estimates in each case coming within \$2,000,000, or about half the cost of the bridge now proposed by the railroads.

Mr. Goulder has also a number of statements from parties interested in the engineering and construction work connected with the tunnels at Chicago, of which that city has some 20 miles, and arrangements have been made by which, if the Michigan Central Co. will ask for bids, a number of Chicago contracts will submit proposals, accompanied by the proper bonds insuring performance of the work, all prices being considerably less than the cost of the proposed bridge.

The accompanying illustration is a good representation of the bridge now proposed for spanning East River at New York. A bill passed by Congress which allowed piers in the river with a span of 2,200 feet between, or twice the length of the middle span in Detroit River, was very sensibly vetoed by President Cleveland. The amended plan, as shown in the picture and submitted to the Secretary of War, is for a suspension bridge with a span of 3,180 feet, being 50 per cent longer than that necessary to span the whole of Detroit River. This bridge will cost \$25,000,000, but this great expense is largely due to the great excess of length and width, six tracks abreast being provided for, and the high value of property necessary for the approaches.

The following letter from Mr. J. R. Oldham is very much to the point:

To the Editor of The Marine Record:

It occurs to me that there are peculiarities connected with the Detroit river trade which are not generally known beyond our lake district. Even if the amount of tonnage passing Detroit were not greater than any other seaport, the space required for the passage of that tonnage should be more commodious than that of any other water-way on account of the peculiar make-up of the tonnage.

In that trade room is not only required for a very large class of steam tonnage, but many steamers are largely encumbered by a number of tow barges, usually from two to four, each separated from the other by a six hundred or eight hundred feet rope.

Now when a steamer is descending a river with a tow she is practically helpless should a sudden necessity arise for stopping, or even for quickly changing her course. Hence it must be evident that a greater breadth of unobstructed water surface is required for passing Detroit than for passing a port with an equal amount of ordinary tonnage; but when the make-up and increasing amount of our tonnage is considered, there can be no question but that greater breadth will very soon be a crying necessity opposite the progressive city of Detroit.

If the only means of crossing the water from Detroit lay between small ferry boats and a high bridge of one span, but few interested people would oppose such a bridge scheme, but as a tunnel is quite practicable and feasible, more convenient, and can be opened for less money than the cost of such a bridge, it seems alto-

gether unreasonable, if not outrageous, to attempt to obstruct that grand water-way in any degree.

JOSEPH R. OLDAAM, C. E.,

EARLY DAYS OF IRON AND STEEL SHIPBUILDING.

When the first attempts were made to build hulls of iron, there were very few tools of a suitable kind available. To start this kind of work was to start a new handicraft, and the men who were put to the work hardly knew themselves what they wanted, or what was likely to serve the turn. Some experience of the work was necessary to reveal the needs of the workmen, and how to furnish them with suitable appliances. The steam boilers of the time were the only structures whose manufacture demanded tools for clipping wrought iron plates, and for punching holes in them. Boilers have been made of iron since 1786—nearly 50 years before iron was used for the building of ships. The haystack boiler and the flat-sided return flue boiler had been constructed for the low pressures which were then deemed sufficient. And there were a few tools in existence that served, after a fashion, to punch and shear iron, and even to bend the iron plates, which, at that time, seldom exceeded $\frac{1}{8}$ -inch in thickness. If a young mechanic of the present day could see one of those primitive punching tools, he would hardly recognize it in any resemblance to the ponderous structures that are now to be seen in shipbuilding yards.

The punching machine of the early period consisted simply of a lever, the long arm of which was raised by a cam at a slow speed, and allowed to descend by its own weight. The short end was provided with a steel punch and, of course, a die was fitted underneath. This "bear," as it was called, was sometimes made of duplex form—another lever, working at the reverse end, did the

DETROIT'S MARINE POSTAL SERVICE.

Harper's Weekly describes the Detroit River postal service as follows:

With the close of navigation on the Great Lakes there came to an end an experiment by the postal authorities of extending the free delivery system of Detroit to the river on which that city is situated. The experiment consisted of delivering to and receiving from vessels mail matter while the vessels were going at full speed. The scheme was in operation during the entire season, and was an unqualified success. For the first month only ninety letters were delivered so passing ships, but before the close of navigation the mail delivery amounted to an average of 500 pieces of mail matter a day. It is the only delivery service of the kind in the world.

The plan adopted was to make use of a yacht, which towed the row-boat directly in front of a passing vessel and left it there. Then came a fine exhibition of watermanship. Just before the steamer crashed down on the row-boat and its occupant, a dexterous twist of the oars placed the little boat under the flank of one of the bows of the steamer. The "bone" in the teeth of the steamer then gave the row-boat a sharp thrust to one side, and as soon as the little craft had ridden the foaming wave the carrier rose in his seat and tossed a light line to the deck of the vessel and then resumed his seat. The line was made fast, and soon the hissing coil of eighty feet was paid out from the row-boat, and with a leap like that of a monster fish attached to a line, the row-boat sprang forward, while the carrier in it hung on with a fierce grip to prevent himself from being hurled overboard.

As soon as the row-boat reached the momentum of the passing vessel, a pail was lowered from above with mail to go ashore, and in it was placed the mail for the ship, after which the line was cast off and the row-boat was picked up by the yacht to which it was attached. This feat of delivering mail was always difficult in smooth water, but on stormy days, and with the river plowed up by a strong sou'wester, it was exceedingly dangerous as well. Darkness added more danger to the

task; but the service grew and soon became a success. It is now proposed to ask Congress for an appropriation to build a swift and strong vessel for boarding purposes, one that will be fast enough to catch any vessel that passes through the river, and one also that will not be damaged by the shock of contact when the mail-boat is made fast to the other vessel.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD by George F. Stone, Secretary Chicago Board of Trade, February 12, 1896.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY. Bushels.
Albany	15,000	90,000	.....	.....	15,000
Baltimore	141,000	1,587,000	49,000	94,000	.....
Boston	89,000	304,000	12,000	.....	.....
Buffalo	2,346,000	107,000	29,000	421,000	1,037,000
" afloat	259,000	.....	223,000	.....	250,000
Chicago	20,578,000	3,522,000	925,000	311,000	21,000
" afloat	148,000	3,512,000	669,000	.....	.....
Cincinnati	17,000	6,000	25,000	28,000	74,000
Detroit	306,000	23,000	12,000	9,000	9,000
" afloat .....	.....	.....	.....	.....	.....
Duluth and Superior	10,712,000	84,000	882,000	176,000	152,000
" afloat	512,000	.....	.....	.....	.....
Indianapolis	113,000	8,000	.....	.....	.....
Kansas City	1,402,000	5,000	33,000	27,000	.....
Milwaukee	418,000	2,000	.....	204,000	37,000
" afloat	176,000	.....	120,000	.....	.....
Minneapolis	20,094,000	61,000	525,000	120,000	242,000
Montreal	583,000	7,000	197,000	3,000	57,000
New York	4,227,000	427,000	1,805,000	25,000	115,000
" afloat	461,000	46,000	225,000	.....	167,000
Oswego .....	.....	.....	.....	.....	90,000
Peoria	10,000	250,000	244,000	4,000	.....
Philadelphia	458,000	715,000	86,000	.....	.....
St. Louis	1,304,000	448,000	606,000	5,000	5,000
" afloat	124,000	.....	.....	.....	.....
Toledo	735,000	524,000	117,000	126,000	.....
" afloat .....	.....	.....	.....	.....	.....
Toronto	27,000	.....	70,000	.....	24,000
On Canal .....	.....	8,000	12,000	.....	.....
On Lakes .....	.....	.....	.....	.....	.....
On Mississippi .....	.....	168,000	.....	.....	.....
Grand Total	65,926,000	11,960,000	6,956,000	1,553,000	2,295,000
Corresponding date 1895	80,733,000	12,651,000	6,942,000	353,000	1,665,000



ESTABLISHED 1878.

PUBLISHED EVERY THURSDAY AT 144 SUPERIOR ST.,
(LEADER BUILDING), CLEVELAND, O.

GEO. L. SMITH, PROPRIETORS.
IRVING B. SMITH,
WILLIAM L. MCCORMICK, EDITOR
BRANCH OFFICE,
CHICAGO, ILL., 238 Lake Street
THOMAS WILLIAMS, Associate Editor.

SUBSCRIPTION.

One copy, one year, postage paid, \$2.00.
One copy, one year, to foreign countries, \$3.00.
Invariably in advance.

ADVERTISING.

Rates given on application.

Entered at Cleveland Postoffice as Second-Class Mail Matter.

CLEVELAND, O., FEBRUARY 20, 1896.

IRVING B. SMITH.

It is with great regret that the MARINE RECORD announces the death of Mr. Irving B. Smith, managing proprietor of the paper, who passed away last Monday night at Chicago, whither he had gone with a view to improving his health after a serious illness lasting several weeks. Mr. Smith assumed control of this paper on March 1, 1890, and was in active charge of the business department for nearly three years, when an affection of the lungs forced him to relinquish his duties and seek a climate less trying to his system. Since that time his connection with the publication of the RECORD has been largely of a supervisory character. Mr. Smith returned to Cleveland in the spring of 1894, greatly improved in health, and continued in a comparatively vigorous condition until the early part of the present winter, when he contracted a severe cold. Convalescence brought with it no increase of strength. Treatment at Chicago effected no improvement. Chicago physicians diagnosed his case as valvular lesion of the heart and this affection hastened the end, dropsy setting in at the last. Mr. Smith's infirmities have of late years prevented him from continuing his personal acquaintance with the marine fraternity at large; but his watchfulness over its interests, his keen business insight, and his careful direction have been important factors in bringing the paper up to its present degree of prosperity. Those associated with him in both business and social life mourn the loss of a cultured gentleman and a considerate friend.

THE PHILLIPS BILL.

LAST week there was published in the RECORD the provisions of a bill introduced by Representative Phillips, chairman of the House Committee on labor, which prescribed the number of officers and seamen to be carried by each type of steam, sailing, and towing craft on the lakes. This bill, while fully as objectionable as the Woodman bill from one standpoint, seems less vicious in its tendencies and results. Congressman Phillips is apparently honest and sincere in his desire to provide for the protection of life and property entrusted to vessels of the Great Lakes, but his bill, in its provisions regarding men, is open to the same charges of absurdity and non-necessity as in the Woodman bill. Very few will contest the wisdom of providing that the masters and mates of sailing and towing vessels shall be licensed officers, but there are some very faulty features and remarkable omissions in the bill which would lead to confusion were it enacted in its present form.

One of the first of these is the provision that a second-class mate or pilot may serve as an officer of the deck of

steamers of from 300 tons upward, while the rules of the inspection service allow a man having second-class papers to have charge of no steam vessel of over 100 tons burden, as was dwelt upon at some length in a recent issue. In fact the requirements of the bill in regard to officers on steam vessels would prove of no utility whatever, as all the largest steamers are better officered at present than is required by the Phillips bill.

Another bad point in the bill is that which provides for examination by a naval officer, and stipulating that the examination in seamanship shall be the same as that in use in the Annapolis academy. Salt and fresh water navigation are so different in character that such an examination would not only shut out many really deserving and capable men, but would not touch upon the many features which are essential to successful lake navigation, or rather pilotage. The fee system has possibly as many advocates as opponents among the masters and mates, so that point need not be argued.

The establishment of a system of examination for licenses which shall be an improvement over that in vogue at present is certainly to be hoped for, but it seems that at present the ideas of Commissioner Chamberlain, of the Bureau of Navigation, should be incorporated in such a measure, as this would have a less revolutionary tendency, and would work out a more gradual change. His idea is ultimately to extend the jurisdiction of the steamboat inspection service to sailing and towing ves-

traveling board, to consist to consist of local and traveling inspectors, with a naval officer as chairman, which should visit each of the principal lake ports, upon dates previously well advertised, remaining at each port long enough to examine all applicants. The latter could be examined more by the class system in this way, and much time and extra work would be taken off the shoulders of the local inspectors. Some permanent arrangement for examining throughout the year at a central lake port should also be provided, in such a way that only one or two inspectors, or possibly the naval officer mentioned, should have charge of the conduct of the examinations, a large number of the questions to be prescribed beforehand, from which the naval officer or other person in charge could select at discretion. If moderate fees were enforced, the expense of operating such a board would be fully covered. At any rate, the plan of Congressman Phillips could hardly be considered fair or feasible.

ATTENTION is called to the text of the bill introduced by Congressman Jenkins, of Wisconsin, providing for a Naval Reserve. It seems to hit the spot, and advocates and promoters of the movement would do well to exert themselves in favor of the passage of the bill. It is intended for prompt enactment and to bring about quick results. It is likely to meet with no opposition, and if local organizers would call the attention of their district Representatives to it, speedy enactment might be secured. The bill is printed in another column.

CANADA is taking great interest in the movement to raise the lake levels by damming. The RECORD has had the pleasure of furnishing, upon application, a copy of the Report of the Senate Committee on Interstate Commerce, treating exhaustively on the subject, to the Director of the Meteorological Service, at Toronto.

PERSONAL.

John P. Devney, Ashtabula shipbuilder had one hand very seriously injured last week.

Capt. Adolph Johns died at his home at Bailey's Harbor, last Thursday morning at the age of 62 years.

Mr. Thomas Quayle, who is on an outing trip in Florida with his brother George L. Quayle, and Capt. Thomas Wilson, has had a severe sick spell, but has recovered.

J. B. Coffinberry, E. M. Pierce and John Steng of Lorain, and Judge Steele, of Oberlin, attorney for the Lorain city council, are at Washington to urge an appropriation for Lorain harbor.

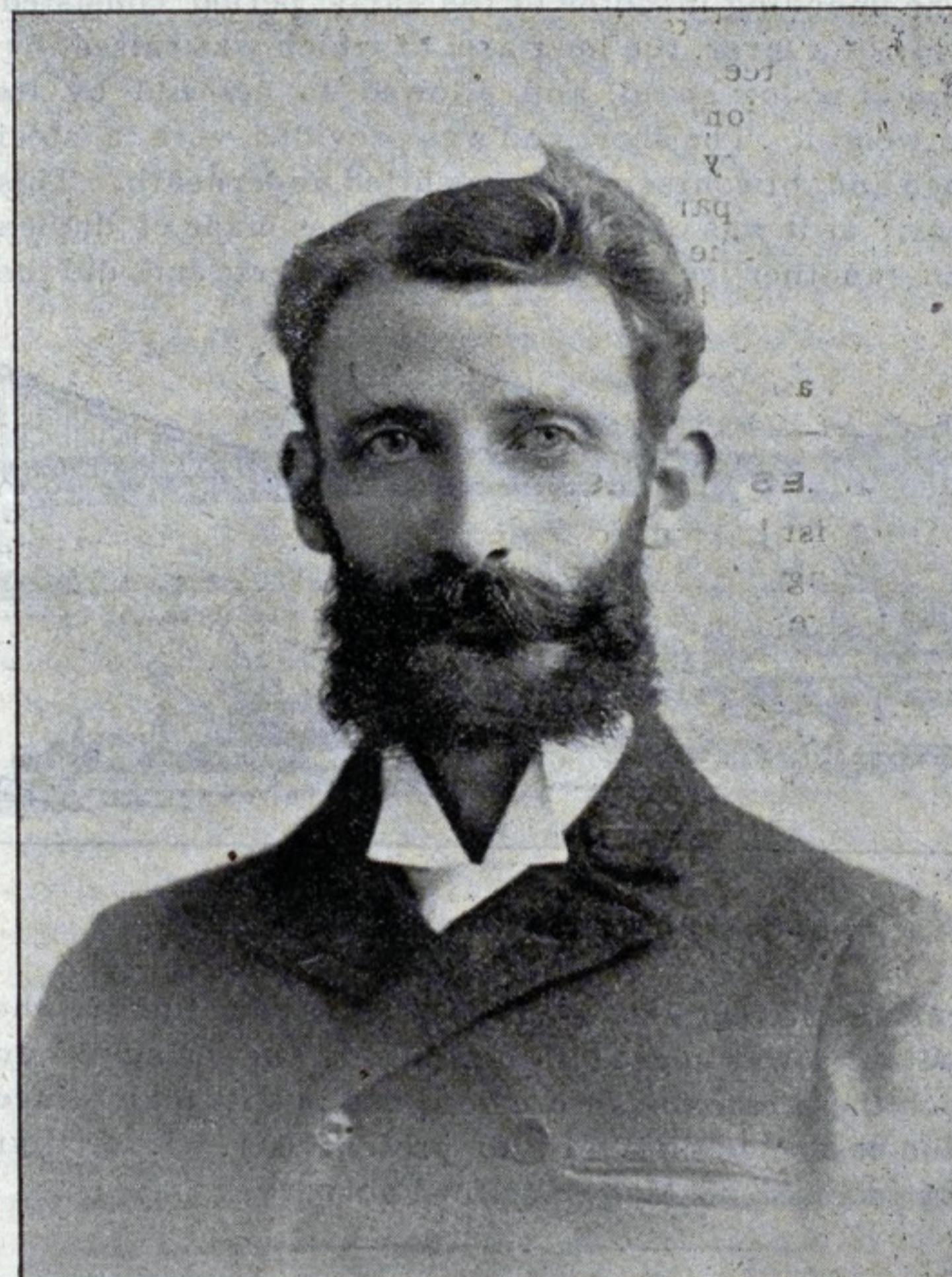
Samuel Risley, formerly for many years chairman of the Dominion board of government boiler and steamboat inspectors, died at Toronto, aged 74. Mr. Risley designed for the Great Western Railway of Canada the first ferries to carry trains across the Detroit river.

Last Saturday a deputation of his employes, headed by Capt. P. C. O'Neil, called upon Mr. John Stang at Lorain, and presented him with a handsome gold-headed cane. The presentation was in honor of his 60th birthday, which occurred yesterday, but was hastened because of Mr. Stang's departure for Washington, where he will remain all this week.

The many friends of Mr. Alfred Smith, who had charge of construction work at the Globe shipyard for several months after the death of his brother, Supt. John Smith, will be glad to learn that he has accepted the position of general foreman for the Detroit Drydock Co., and has already begun his duties. He is at present superintending the lengthening of the Fayette Brown, which is in Clark's dock.

The water has so receded with the fall in the lake level as to leave the life-saving station at Grindstone City high and dry, and the department has had to cast about for a better location. One mile northwest of the present site is a piece of land that has been offered free by the Flint & Pere Marquette road, and this has been accepted, as it gives plenty of water no matter what the level.

Wisconsin and Michigan gentlemen who appeared before Congressional committees to ask for appropriations for Lake Michigan harbors, announce that a car ferry line is soon to be established between Milwaukee and Muskegon.



IRVING B. SMITH.

THE NEW HURON TUG.

(CONTINUED FROM PAGE 3)

Her engine will be of high pressure, and will be built by Clough, Witt & Co. The Scotch-type boiler will be built by The River Machine & Boiler Co. She will be equipped with a new type of reversing-blade propeller.

The rebuilt tug Tom Maytham will be launched at the Ship Owners' dry-dock as soon as the weather moderates. Her engine has been rebuilt and replaced, and her boilers, which have been rebuilding at the Globe shipyard, will be put into her at once.

INLAND LLOYDS CLASSIFICATION.

The Inland Lloyds committee on classification is holding daily meetings at the office of Manager Dan McLeod, in the Perry-Payne building Cleveland. It will require about two weeks to complete the work. Those present include Capt. Amassa Fitch, of Chicago; Capt. C. M. Davis, of Milwaukee; Capt. J. V. Tuttle, of Milwaukee; Capt. C. Sinclair, of Chicago; Capt. William Morris, of Detroit; Capt. W. H. Rounds, of Chicago; Capt. Dan McLeod, of Cleveland; Capt. Perew, J. J. Orr and George McLeod, of Buffalo.

GENERAL REPAIR WORK.

CLEVELAND.—The matter of late has been of a character to delay both building and repair work very seriously. At the Ship-Owners' dry dock the Olympia is in for repairs to her stern bearing and some new planking to replace what was damaged by ice, last fall.

OWEN SOUND.—The repairs to the steamer W. B. Hall, will include an upper deck similar to that of the Myles and Tilley. The planking is about completed. The steel is here for the steel arches and the steel keelson. The keelson plates are of $\frac{3}{8}$ steel by 24 inches in depth, and with the steel arches will give the vessel the rigidity necessary for her increased length. The Bertram Co. of Toronto, have the contract for the new engine and boiler. The latter will be of the Scotch type, 11x12 $\frac{1}{2}$ feet, capable of carrying 150 lbs. pressure. The engine will be a fore-and-aft compound with cylinders 20 and 40 by 3 inches stroke. A new shaft and wheel will be given the vessel, the latter being ten feet in diameter with 13 feet pitch. This will be practically double the power which the vessel has had, and a speed of 12 miles is expected of her. Capt. W. H. Featherstonehaugh is looking after the work for the owners and the Blue Line will have a fine steamer. The City of Owen Sound will also be converted into a more modern craft by the addition of an upper deck. She will also be a staunch craft.

ALPENA.—The Sam Flint is receiving new deck, deck-beams, and two new spars instead of the three she formerly carried. The spars will be higher, and she will carry more canvas than formerly. The Flint was dry-docked after being ashore at Death's Door last fall, new planks put in where needed and thoroughly recalked.

The John Owen is receiving a new upper deck, new rails and other repairs.

The tug Fred B. is having a thorough rebuild. She is in Gilchrist's dry-dock and has been entirely replanked, her boiler and engine taken out and put in order, and other repairs.

The Westford and Monitor are being overhauled under charge of Capt. Luddington.

The propellers Fletcher and Jenks, and the tugs Frank W. and Ralph will receive considerable repairs, as will also the barges Light Guard, Lathrop, Knight Templar and Russian.

The Kitchen will have her false bottom taken out and receive other changes to fit her for their lumber trade, she having always carried stone, plaster, etc.

PORT HURON—Lester, the ship builder, of Marine City, is here with a large gang of men at work on the steamer Bertanic repairing her stern and side where she was struck by the Montana and Russia. She was sunk in Detroit river last summer and raised by the McMorran Wrecking Co., was sold by U. S. Marshall and bid in by H. McMorran of this city. She will be managed by Capt. A. M. Neal.

About half the frames are up of Loud & Sons' new tug. They have to hustle to get her ready by the time the rafting season begins. Capt. Ed Allum is here looking after the work. She will be one of the finest tugs ever turned out at this port.

KENDALL.

CHICAGO.—At Miller Brothers' shipyard the schooner William D. Becker is in dock for some new bottom

planking and general repairs and a new rudder the steamers W. G. Averill and Governor Smith are receiving general repairs. William Saville, shipbuilder, is giving the schooner S. M. Stephenson a general overhauling and recalking her deck, and the schooner Farming Neil some general repairs.

WILLIAMS.

REPAIR NOTES.

The schooner Oscar Newhouse is getting a new stern at Manitowoc. The Jessie Martin is getting a new foremast and jibboom, and the Emma L. Neilson a new foremast and other repairs.

The river passenger steamer Mary is having her engines thoroughly overhauled at Marine City.

The new name of the rebuilt Goodrich liner Menominee will be State of Iowa, instead of Nebraska, as at first decided.

The steamer Helena is in the stationary drydock at the south yard, Milwaukee. She will require the renewal of considerable bottom plank as the result of "touch-and-go" damage last season. The Helena's stay in the dock is expected to be about a fortnight and her repair bill will amount to several thousand dollars.

The steamers Corsican and Hamilton of the R. & O. N. Company are undergoing extensive repairs at Kingston. New paddle boxes are replacing the old ones on the steamer Corsican. The machinery in all the boats are being overhauled. The shaft in the steamer Hamilton will be lowered 7 inches.

The shaft for the tug Marion is being made at the McKinnon Iron Works, Ashtabula. It is five inches in diameter and fifteen feet long.

In the new portion of Wheeler & Co.'s yard, West Bay City, the machinery is arriving and being placed in position, and this part will be ready for operation in about a month. The elevator tracks and hoisting apparatus are about two-thirds completed, and will be ready by the time the shops are equipped. The new joiner shop is also well advanced.

SALES OF VESSEL PROPERTY.

J. C. Gilchrist has added to his fleet the schooner F. A. Georger, having purchased her from John J. Duffey and others, of Cleveland, for \$14,000. He has also acquired F. H. Bacon's interest in the schooner M. S. Bacon, the consideration not being made public.

The Wyandotte, Mich., Boat Co., which rebuilt the barge Peshtigo into a steamer, has now sold her to A. M. & F. P. Cheseborough, of Saginaw.

The schooner Atmosphere was sold at Sarnia by order of court last Thursday. R. P. Thompson, of the Thompson tug line, Port Huron, paid \$1,850 for her and will convert her into a wrecking barge.

The new Ashtabula Towing Co., composed of the personnel of the Vessel Owners' Towing Co., of Cleveland, has purchased the six tugs which were formerly engaged at Ashtabula, the William D., John Gordon, Kunkle Bros., Sunol, Kittie Downs, and Red Cloud.

Recent transfers at Chicago are: Schooner Horace Taber, Mrs. Antoinette Swenson to Peter W. Peterson, all, \$1,000; schooner Lake Forest, W. D. Hitchcock to Chas. E. and Ervin P. Hinds, all, \$5,500; schooner T. Y. Avery, M. A. Gunderson to John W. and Mannes J. Bonner, all, \$800.

John Corrigan of Cleveland, has sold the schooner J. I. Case to McArthur Bros., of Detroit, who will use her as a timber carrier.

CHARTS OF THE SAULT.

The Engineers' Charts of the Sault Passage have been carefully revised and corrected from the surveys taken last summer by special parties who were at work there during the season. All the new lights and the Hay Lake channel are accurately indicated, and in the time intervening before the issue of the new charts of this locality, which will not occur much before midsummer, these charts will be found of special value. The RECORD hopes that its readers will not be deceived by any attempt to foist alleged "new charts" upon them, as they are the old charts corrected up to date. They may be obtained at this office, No. 144 Superior street, at 30 cents each.

L. Black & Co., opticians and importers of mathematical instruments, are issuing a card to the marine fraternity which contains rules for foretelling the weather by means of aneroid barometers.

APPOINTMENTS FOR NEXT SEASON.

The following appointments of masters and engineers for the season of 1896, have been announced by owners:

STEAMER.	MASTER.	ENGINEER.
Armour, P. D.	Chamberlain, F. D.	Mason, J. K.
Aurora.	Donaldson, Robert	Cummings, James
Atlantic (Br.)	Wilson, James	Aston, J.
Bartlett, E. B.	Jones, R.	Harsant, W.
City of Kal'mazoo	Morris, David	Larell, Jack
Cherokee.	Hagen, John	Foster, D. M.
Colgate.	Kilby, W. H.	Pierce, J. H.
Colorado.	McLeod, John	Birch, Thomas
Corona.	Murphy, Stephen	Stiver, F. C.
Corsica.	Walsh, J. A. Clark	Clement.
Colonial.	Stover, J. W.	Masters, George
Continental.	Megarvey, Wm.	Smith, John
City of Glasgow.	McNeff, John	Price, C. R.
Denver.	Christiansen, Peter	Smith, John
Eggn, W. M.	Howe, Fred	Coleman, Fred
Fitzgerald.	Boyce, Leslie E.	McNeil, —
Green, C. H.	Little, C. E.	Lee, John
Glenn.	Swails, Frank	La Bounty, C.
Hill, J. J.	Andrews, John	Lockhart, A.
Hoyt, Colgate.	Parke, J. S.	Patterson, G.
Keararge.	McDowell, R.	June, P. P.
Livingston.	Wilson, Wm. H.	Morison, Alex
Lorain L.	Inghram, Charles	Jenkins, Thomas
Manola.	McCallum, H. C.	Jamieson, M.
Marina.	Morgan, J. W.	Black, D. A.
Mariska.	Root, F. D.	Smith, F. A.
Mari ana.	Zealand, H.	Canton, P.
Maruba.	Bassett, C. H.	Arnold, George
Masaba.	Reed, A. H.	McCanna, B. F.
Mather, S.	Hoffman, F.	Wilcox, A. L.
Matua.	Dunn, John	McKiezie, A.
Mohegan.	McFarland, A.	Tyer, W.
Mo ley, W. B.	Hagen, Wm.	Ragan, Jas.
Majestic (Br.)	Nicolson, I. A.	Caniff, P.
Northern Belle.	Campbell, P. M.	Lewis, W.
Owego.	Jacques, A.	Wil on, S.
Omaha.	Byrne, John	Wall, C. W.
Osceola.	Boyce, Hawley M.	Staley, A.
Oscoda.	McLean, J. C.	Morril, Thos.
Palmer.	Ryan, George W.	Spear, Robert
Panther.	Strilphen, Geo. F.	Hodge, Robert B.
Pathfinder.	Gilsen, T. D.	Sebastian, L. H.
Pentland.	McGregor, W. B.	Heiner, C. A.
Plankinton.	McCambridge, Thos.	Ball, C.
Pueblo.	Powell, Lewis H.	Fell, Wm.
Pacific (Br.).	Stalker, Duncan	Neil, Edward O.
Rockefeller, F. D.	Foote, R. D.	Aston, J. B.
St. Lawrence.	McArthur, John	Marshall, Irwin
Sawyer, W. H.	Byrnes, Ralph	Durant, T.
St. te of Michigan	Jenkins, John	Gulitti, Nelson
Topeka.	Dale, Fred R.	Harling, Walter
Trevor, John B.	Gibbs, Albert	Myers, J. H.
Victory.	Chambers, A. P.	Blaauvelt, George
Williams, H. W.	Cottrell, J. P.	Densmore, Wm.
Wilson, Thos.	Boyne, John	Peterson, R.
	Boyce, M. A.	Smith, A. J.
SCHOONER.	MASTER.	
Auranic.	Robinson, Thos. J.	
Baltic.	O'Donnell, Thos.	
Camden.	VanRenssalaer, J.	
Chippewa.	Davidson, John	
Corning, Ida.	Edgar, P. H.	
Dunn, S. H. (Br.)	Dix, James	
Fryer.	Jacques, Ely	
Genoa.	Ryan, D. C.	
Grinsby (Br.).	Maitland, G. W.	
Keating, A. C.	Ryan, Patrick	
King, C. G.	Edgar, Peter	
Law, Lizzie A.	Starkey, M. J.	
Martin, M.	Elbe, Harry	
Marvin, S. E.	Brines, Wm.	
Magnetic.	Rodgers, Harry	
Malta.	Culp, H.	
Manda.	Holly, William	
Marcia.	Sawyer, E. L.	
Martha.	Crowley, F. P.	
Minch, Sophia	Fisher, Horace	
Mingoe.	Snelgrove, A.	
Neilson, Emma.	Neilson, Paul	
Newhouse, Oscar.	Hanson, H. L.	
Olive Jeannette	Cadotte, David	
Our Son.	Edgar, W. A.	
Paige, Joseph	Rose, Stephen	
Planet.	Parsson, Frank	
Redfern, C. E.	Townsend, C. O.	
Richards, May	Martin, John	
Rutter, J. H.	Eberlein, John	
Smith, Angus	Townsend, Owen	
Schilde.	Adams, Joseph	
Sagamore.	Weeks, John	
Troy.	Dean, H. C.	
Tuxbury, A. C.	Powers, Wyman	
Typo.	Henderson, Hi.	
Warmington.	Coles, Frank	
Watson, S. V. R.	Woods, Chas.	
Yukon.	Forbes, Wm.	
Youtell, Clara (Br.)	Colwill, W. J.	

There are 17,000 licensed marine engineers in the United States.

IN THE ENGINE ROOM.

RELATIONS OF POWER AND SPEED.

Many marine engineers do not understand why the power required to propel a vessel varies of the cube of the speed says Home Study. The following it is hoped will make this clear:

Suppose we have a tank nearly filled with water, as shown in Fig 1. Floating within the tank, and weighted down so as its upper surface is at the water level, is a block of wood *B* in the form of a cube. This block may be towed through the water in a direction perpendicular to its surface *B'* by means of the string *C* which passes over two small pulleys at the right hand end of the tank, as shown. To the free end of the string a weight *W* may be attached. Since two bodies cannot occupy the same space at the same time, when the block moves through the water, it displaces the water in front of it, which closes in again behind. The volume of water displaced in a certain time when the block is in motion, is evidently the product of the area of the surface *B'* and the distance the block moves within that time. For instance, if the surface *B'* be one square foot the volume of water displaced in one second at a speed of one foot in one second, is one cubic foot; at a speed of two feet in one second, two cubic feet, and so on. In order to move the block through the water, a force which in this instance is supplied by the weight *W* must be applied to the block. It will be understood that the force necessary to move the block at a certain speed is the measure of the resistance of the water against the block at that speed. Assume that a weight of three pounds attached to the string *C* was found necessary to tow the block through the water at a uniform rate of one inch in one second; then, in 120 seconds the block will move a distance of 120 inches. Therefore, since work is the product of force into distance, and since the force in this case is three pounds and acts through a distance of $\frac{120}{12} = 10$ feet, the work done is $10 \times 3 = 30$ foot-pounds. As this amount of work is done in 120 sec-

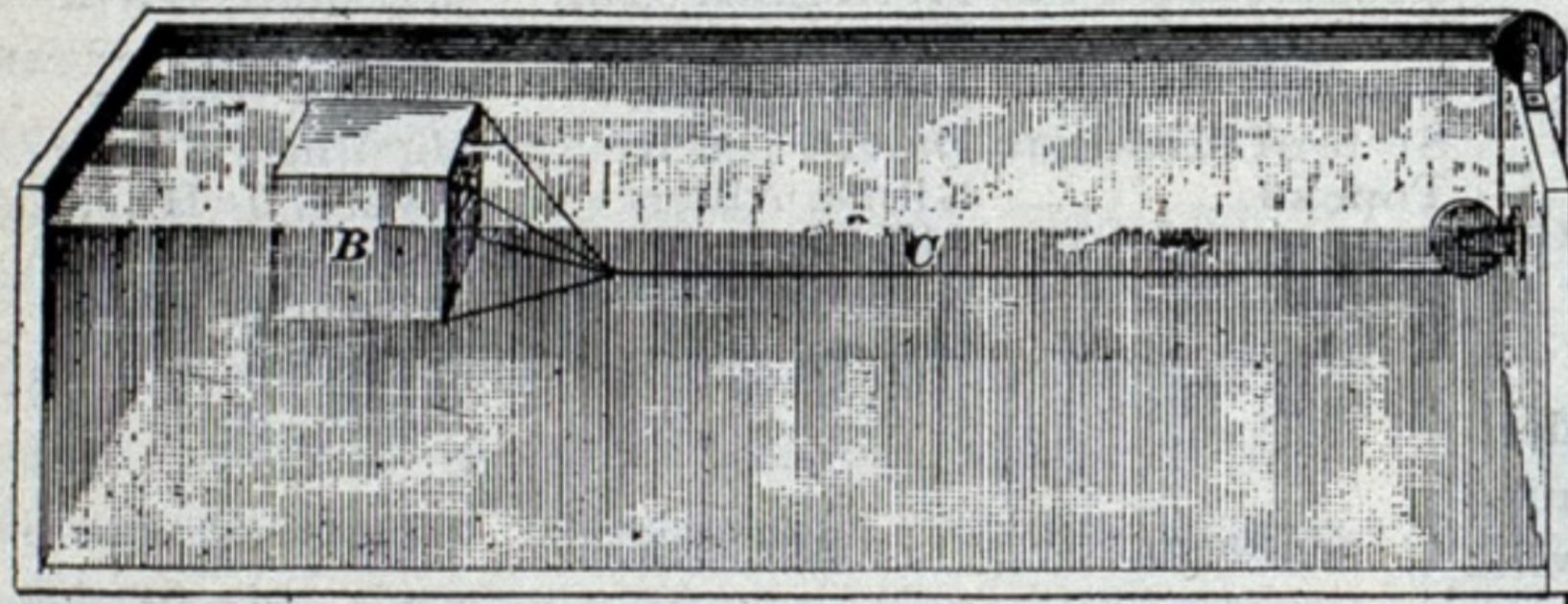


FIG. 1.

onds the horsepower necessary to do this work is

$$\frac{30 \times 60}{33,000 \times 120} = \frac{1}{2,200} \text{ horsepower.}$$

Thus it is seen that under the above assumption $\frac{120}{12} = 10$ horse power is required to tow the block of wood through the water at a speed of one inch in one second for a distance of 120 inches.

We will now find what weight must be attached to the string to tow the block at the rate of two inches in one second, or twice as fast in the former case. By trial, it will be found that 12 as fast in the former case. By trial, it will be found that 12 pounds are required to give the desired velocity. Thus it is seen that to double the speed four times the weight was necessary from which the general law may be established, that the resistance to a body moving through water varies as the square of the velocity. Had the velocity been quadrupled, it would have been found that $4^2 \times 3 = 48$ pounds would have been required.

In the above case as the block now moves twice as fast, it will cover a distance of 120 inches in one-half of the time; *i. e.*, in 60 seconds. The work done in that time is $12 \times 10 = 120$ foot-pounds, and the horsepower necessary to tow the block through the water at a speed of two inches in one second a distance of 120 inches is

$$\frac{120 \times 60}{33,000 \times 60} = \frac{1}{2,200}$$

horsepower.

$$\frac{33,000 \times 60}{33,000 \times 60} = \frac{1}{2,200}$$

But, as $\frac{1}{2,200}$ divided by $\frac{1}{2,200} = 8$, it is seen that in order to double the speed of the block, eight times the amount of power is required. From the above experiments the following general law may be deduced: The power required to propel a vessel varies as the cube of the speed. In order to show that the shape of the block does not influence the results arrived at in the experiments, assume

the block shown in Fig. 2 to be substituted for the block *B*. If it be towed through the water, it will, owing to its shape, displace the water gently.

But, assuming the area *a b c d* to be equal to the area of the surface *B'* Fig. 1, the water displaced by the two blocks will be the same for equal speeds and equal increments of time. As the water is displaced gently by

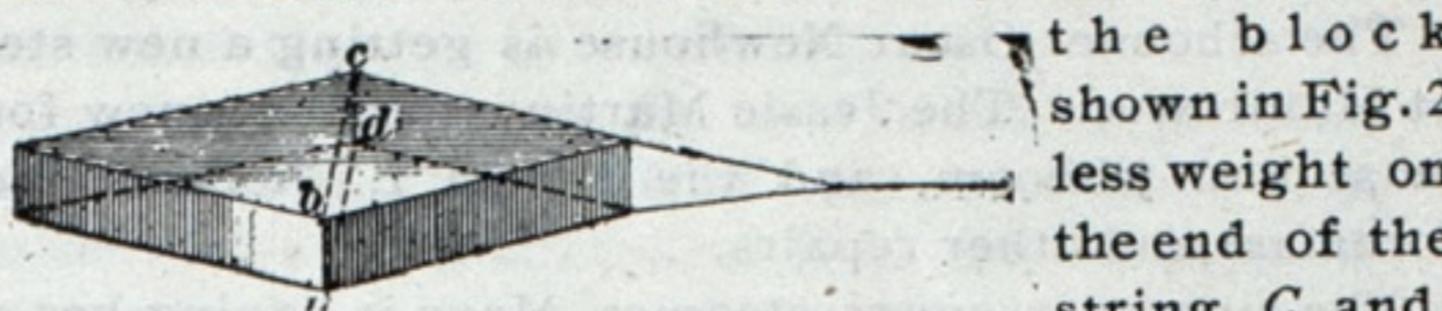


FIG. 2.

the block shown in Fig. 2 less weight on the end of the string *C* and, and hence, less power is re-

quired to move it a given distance at the rate of one inch in one second. But, if the speed is doubled, it will be found that the force is increased in the same proportion as in the first case considered; that is, four times the weight is required.

Let us apply the law to a practical example. A vessel fitted with an engine developing 800 net horsepower, has a speed of 15 miles per hour. How much would the power of the machinery have to be increased to propel the vessel at the rate of 17 miles per hour? Applying the law, we have the following proportion: $15^3 : 17^3 :: 800 : \text{the required horsepower.}$

That is, $3,375 : 4,913 :: 800 : 1,164.56$. Thus it is seen that to increase the speed two miles per hour, the power of the machinery must be increased $1,164.56 - 800 = 364.56$ net horsepower. In practice, however, as the friction of the hull of the vessel is not constant at all speeds, also, as the efficiency of the machinery as well as the propelling instrument is not the same at all speeds, according to circumstances, slightly more or less power than calculated, may be required for the desired increase in speed.

BOILER FEED PUMPS.

In order to get the size of boiler feed pumps we have to know the amount of water we require. We will take for our boiler one having 15,000 feet of heating surface; under favorable circumstances this would be reckoned a 100 H. P. boiler. The standard adopted by the A. S. M. E. for the horse-power of boilers—the hourly evaporation of 30 pounds of feed water at 100° F., into steam at 70 pounds gauge pressure—has the advantage of approximating very closely to the requirements of the modern stationary engine.

As 30 pounds of water equals 3.6 gallons for each horse-power per hour, a 100-horse-power boiler will require 100 times as much, which would be 360 gallons per hour. In proportioning pumps, however, it is well to remember that boiler work is seldom perfectly steady, and that as the engine cuts off just as much steam as the work demands at each stroke, all the discrepancies of demand and supply have to be equalized in the boiler. Therefore, we may often have to evaporate during one-half hour from 50 to 75 per cent more than the normal requirements. For this reason it is sound policy to arrange the pumps so that 630 gallons per hour, or 10.5 gallons per minute, may be handled by them without undue speed or friction.

PITCH OF PROPELLERS.

Engineer, New York, makes the following reply to a New York correspondence who inquires: "How is the pitch of the screw arrived at for high-speed boats? In other words. If I want to make a boat go twenty miles per hour how shall I pitch the screw?"

The pitch is fixed by the number of revolutions the engine is to make for a given speed. Suppose it is desired to run the engine at 300 revolutions per minute for a speed of 20 miles per hour, then assuming the pitch to be 6 feet the vessel would advance 1,800 feet per minute, neglecting slip. In 20 miles there are 105,000 feet ($5,280 \times 20$) so that 1,800 feet per minute would give us 108,000 feet advance in one hour, neglecting slip. As this last is fully 20 per cent. in small wheels we must add 20 per cent. for it, making the pitch 7 feet $2\frac{1}{2}$ in. The diameter of the screw is another consideration and the usual practice is—diameter equals three-fourths of the pitch.

JAPAN proposes to build up her commercial navy by giving subsidies to shipbuilders for every ton above 1,000, and to ship owners for all ships of 1,000 tons that can make ten knots an hour, the subsidy being increased for every 500 tons additional burden or every knot additional speed.

PROVIDING FOR THE NAVAL RESERVE.

Congressman Jenkins, of Wisconsin, has introduced in the House the following bill, No. 5555, which was referred to the Committee on Naval Affairs. Its text is as follows:

Whereas, House bill 10,622, introduced June 26, 1888, providing for the enrollment of naval militia and the re-organization of naval forces, made it lawful in States and territories bordering on the sea and lake coast and navigable rivers to enroll and designate as the naval militia all seafaring men of whatever calling, and all men engaged in the navigation of the rivers, lakes, and other waters, together with shipowners and their employees, yacht owners, members of yacht clubs, and other associations for aquatic pursuits, and all ex-officers and former enlisted men of the navy.

Whereas, although this measure did not become a law, it was made the basis of law in various States, and on March 1, 1895, there were enrolled in 13 States a naval militia of 2,695 enlisted men;

Whereas, the States of Ohio, Indiana, Wisconsin and Minnesota have no organization of naval militia, and the naval militia of the States of New York and Pennsylvania are located in the seacoast cities of those States, leaving for the protection of the shipping and cities of the Great Lakes only the naval militia of Illinois and Michigan, numbering 387 men;

Whereas, the report of the Secretary of the Navy for 1895 calls attention to the fact that the number of men allowed by existing laws are all in active service, and it is proposed to keep as first-class reserve certain vessels of the navy for which no regular crews are provided;

Whereas, the organizations of naval militia under the different State laws are somewhat restricted by State lines, and there is no especial provision for these forces being called into the service of the general government; now therefore,

Be it enacted, etc., That the Secretary of the Navy be authorized to encourage organizations of national naval volunteers in all States bordering upon the Great Lakes, and to draw up such regulations for their enlistment and government as shall, in his judgment, conduce to uniformity and efficiency.

2—That the Ordnance Bureau of the Navy be authorized to furnish for the defense of lake cities and the use of naval volunteers such ordnance, machine and rapid fire guns, boat howitzers and other small arms as the Secretary of the Navy may approve; provided, that said arms of all kinds shall remain the property of the United States, subject to the order of the Secretary of the Navy, and shall only be supplied when proof is furnished of the enlistment of a sufficient number of suitable men in accordance with the regulations of the Navy Department.

3—That the Secretary of the Navy be authorized to furnish each of the national volunteers one blue uniform and one pea jacket such as are worn by the seamen of the navy; provided, that no such uniform shall be furnished until the men are mustered and have signed enlistment papers such as the Secretary of the Navy shall furnish, and for not less than one year's service.

4—That such national naval volunteers shall receive no pay or compensation from the government other than the uniforms, except when called into the service of the United States, when their pay and rations shall be those of the navy.

5—That the Secretary of the Navy is hereby authorized to detail ensigns or lieutenants of the junior grade to drill such national naval volunteers whenever in his judgment it is advisable; but when called together for drilling purposes the said volunteers shall not be considered as called into the service of the United States, unless they are required to leave their places of enlistment. The Secretary of the Navy is also authorized to detail a paymaster to take up the accounts, disburse the funds, and issue the clothing as required by this act.

6—That the enlistment papers signed by said national naval volunteers shall subject them to the orders of the President of the United States and the Secretary of the Navy for service in time of war, either afloat or on the shore, and either for defense of the commerce of the Great Lakes, or for manning the vessels of the navy.

7—That to secure the rapid enlistment of such naval volunteers and the completion of their organization before the opening of navigation the Secretary of the navy is authorized to employ one or more suitable persons and, if he deems it expedient, to have an office in one of the lake cities, with the necessary clerical assistance, the head of such office to be some citizen well acquainted with the commerce of the Great Lakes, and of some naval or military experience, the pay of such official to be that of a commander.

8—That for the purpose of promptly and efficiently carrying out the purposes of this act the sum of \$25,000, or such portion thereof as may be necessary, is hereby appropriated.

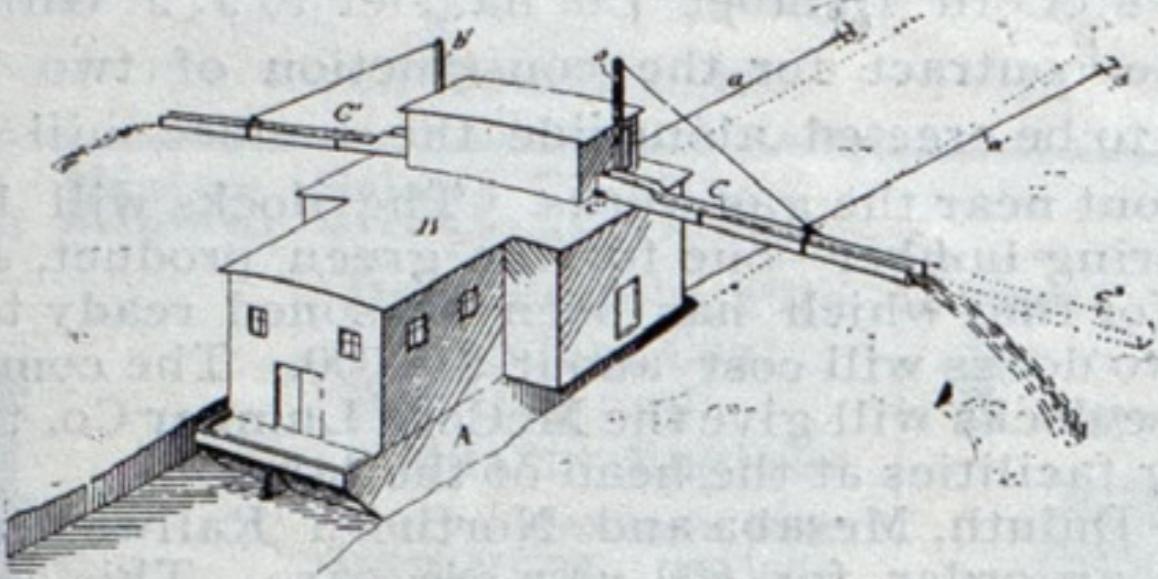
TURKISH complications have apparently made Russia even more desirous of completing her railway, and to accomplish this object that government has sent an agent to negotiate with American contractors. This agent, who was lately in Seattle, is Count De Tolance, a civil engineer, and is said to be conferring with a San Francisco firm, with the object of letting a contract for the construction of part of the road.

NEW INVENTIONS.

The following patents have been granted within the week on devices relating to water craft and commerce:

No. 554,510. Dredging Machine. Samuel A. Hill, Philadelphia. Filed September 7, 1894.

Claim. In a dredge, the combination of two vertically revolving cutters, means for automatically reciprocating the same in constant relation to each other; and pumping and discharge mechanism for removing the soil which is produced by the action of the cutters; transverse beams on which two bearings of the cutters slide; mechanism for operating them, and for automatically reversing each cutter at the end of its course.



In a dredge, the combination of a vertically revolving cutter, reciprocating latterly across its front; a suction pipe, the lower end of which is held in attendance upon the lower end of the cutter; a stationary pump operating in said suction pipe; and a flexible connection introduced in the downwardly projection portion of the suction pipe.

No. 554,331. Screw Propeller. Mellen R. Bray, Boston, Mass. Filed June 27, 1895.

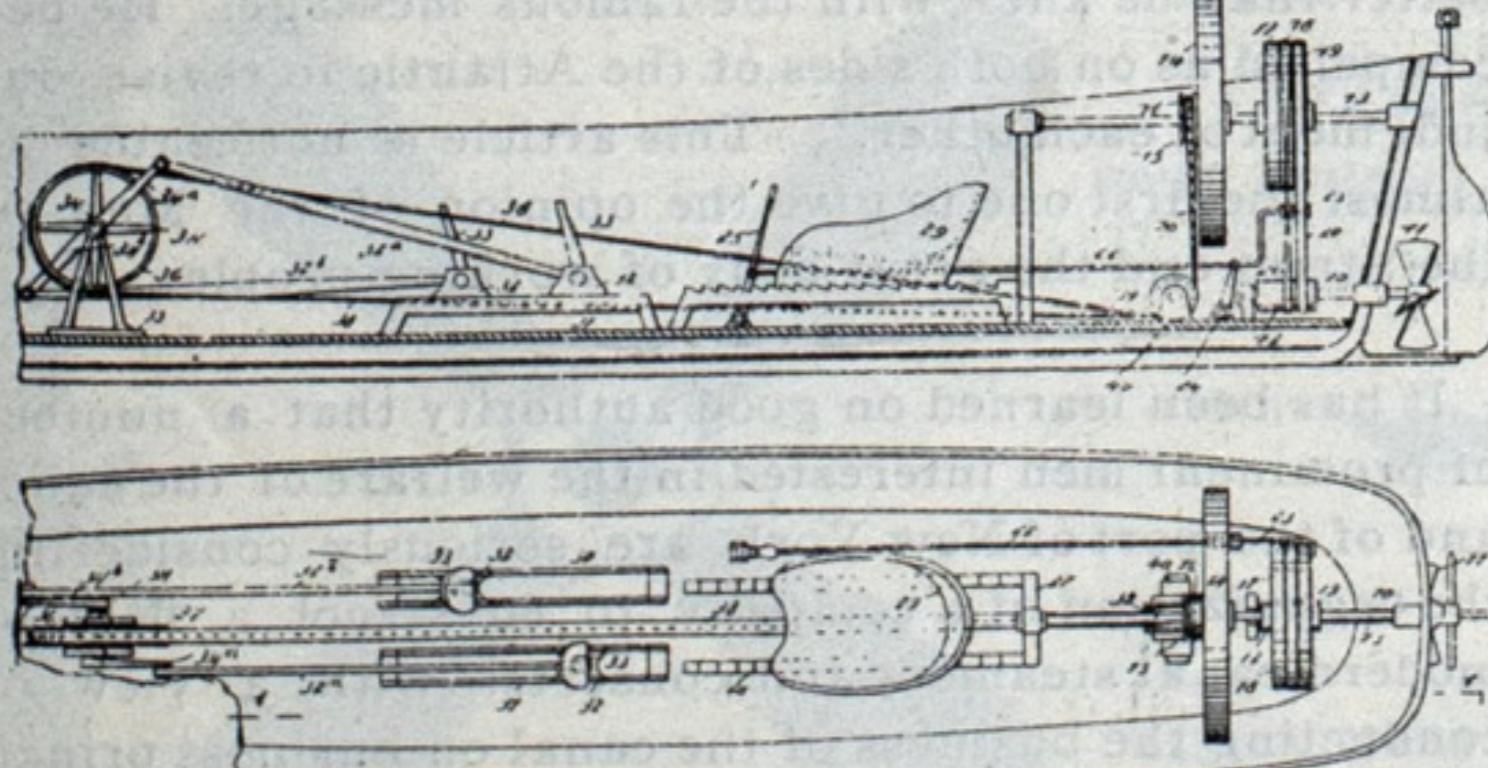
Claim. In a screw propeller, the combination of an operating shaft; a hub secured to said shaft in a fixed position and provided with a plurality of journal-boxes to receive the journals of the propeller blades, and with a plurality of longitudinal guideways arranged eccentric to the axis of revolution of said hub; a plurality of blades revolvably mounted in said journal-boxes; a crank formed upon, or secured to, the inner end of each of the journals of said blades; a hub fitted upon, revolvable with, and movable endwise of said operating shaft, and provided with a circumferential groove; a plurality of bars fitted to said longitudinal guideways so as to be supported thereby, and movable endwise therein, and firmly secured at one end to said

endwise-movable hub, and provided, at their other ends, with rectangular transverse notches or grooves; a rectangular block mounted upon each crank-pin of said blades and engaged by said rectangular notches in said bars; and means for moving hub and bars endwise of the propeller-shaft.

The combination of the shaft A; the hub B provided with the boxes B' B'' and with longitudinal guideways eccentric to its axis of revolution; the blades C provided with the journals C'; the cranks b; crank-pins b'; the blocks c fitted to said crank-pins; the hub D provided with the circumferential groove d'; the shipping yoke E; and the arms D' fitted to and supported by said guideways, and connecting said hub D to the cranks b.

No. 554,589. Propulsion of Boats. Walter Forward, San Diego, Cal. Filed June 14, 1895.

Claim. In the propulsion of vessels, a power-shaft, foot-rests, capable of sliding movement in reverse directions, a driving connection between the foot-rests and the power-shaft, a propeller-shaft, a drive-shaft located adjacent thereto, a belt connection between the power-shaft



and the drive-shaft, fixed and loose pulleys located on the drive-shaft, a crossed and a straight belt connecting respectively one of the fast and one of the loose pulleys

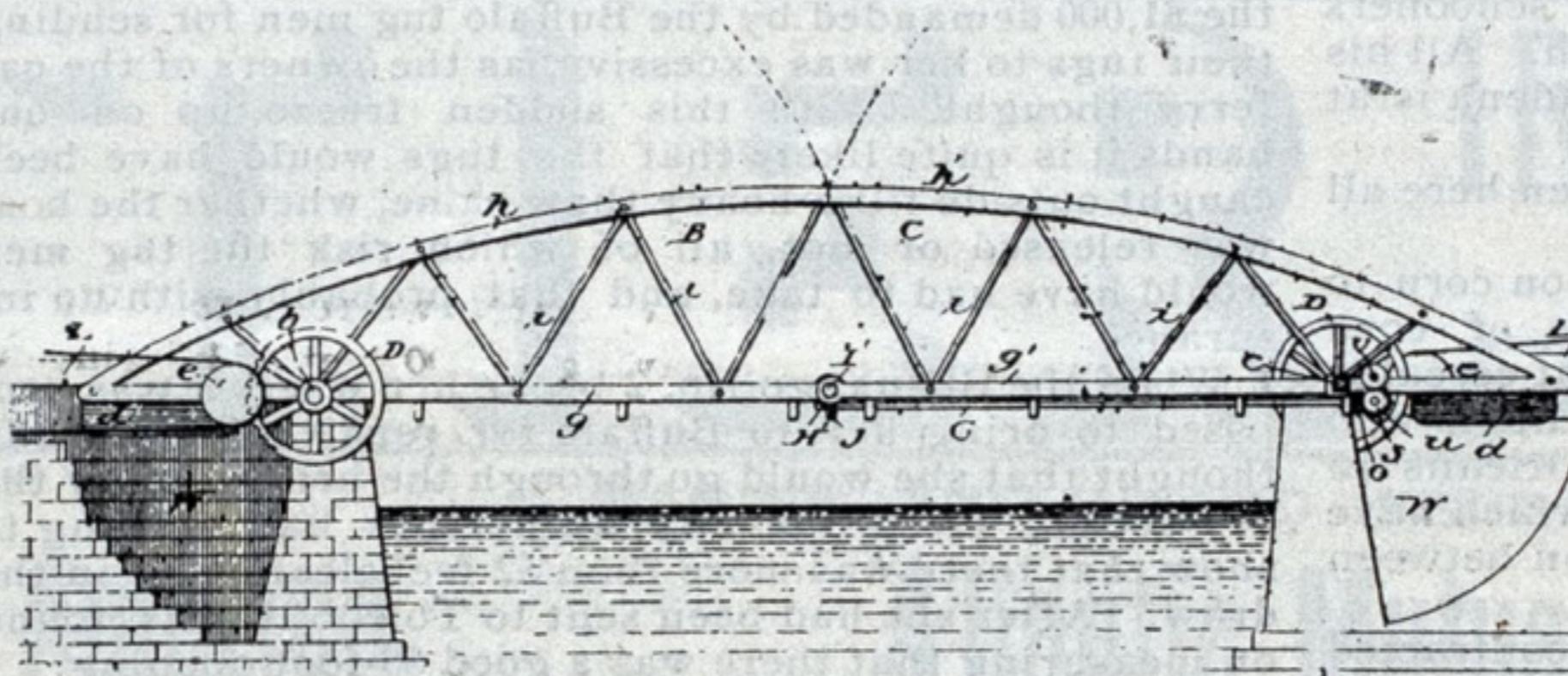
with the propeller-shaft, and a shifting mechanism connected with the said belts.

In the propulsion of vessels, the combination, with slideways, foot-rests having movement in said slideways and adapted to travel in reverse directions, a power-shaft, and a pitman-and-crank connection between each of the foot-rests and said power-shaft, the cranks being reversely placed, of a second power-shaft mounted longitudinally in the stern, a propeller shaft therebelow and parallel therewith, a belt connection between the second power-shaft and the drive-shaft, a balance-wheel secured on the drive-shaft, driving-pulleys fixed on the drive-shaft, and an idler also on the second drive-shaft between the said fixed pulleys, a straight belt and a crossed belt respectively connecting one of the fixed pulleys and the idler with the propeller shaft, and means, substantially as shown and described, for shifting the said belts, whereby the drive-shaft is revolved in the same direction, whether the boat is traveling forward or rearward, and whereby also the operator may be seated facing the bow.

No. 554,390. Drawbridge. Edwin B. Jennings, Springfield, Mass. Filed October 15, 1895.

Claim. A truss bridge bisected at or near its middle part, the sections of the compression member being adapted to abut and bear against each other in the closed position, and the meeting ends of the tension member being provided with eyes registering when in the closed position, said sections being pivotally mounted upon the abutments and provided with readily movable pins to engage with and be disengaged from the eyes of the tension member.

The combination with a centrally bisected truss forming as shown and described, the two vertically rotating



sections of a drawbridge, of faced ends upon the upper chords, and eyes upon the lower chords arranged to have said faced ends bear and the eyes correspond when the bridge sections are in a horizontal position, transversely reciprocating bolts in one section in line with the eyes thereof, and adapted to enter said eyes, and mechanism operated from the pivot end of the section for reciprocating the bolts.

No. 554,349. Anti-Capsizing and Live-Saving Apparatus for Small Boats. Waldemar Von Rüdiger, Halle-on-the-Saale, Germany. Filed September 8, 1894. Patented in England, Belgium, Austria, France, Hungary, and Germany.

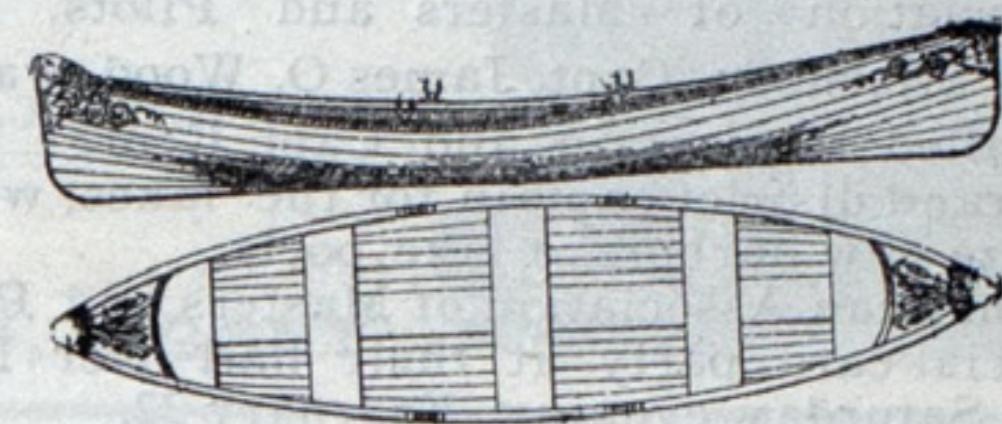
Claim. The combination with a boat, of a buoyant body, arms hinged to the boat and supporting said buoyant body at their upper ends, and weighted arms or clips also hinged to the boat and confining the buoyant body in a position adjacent to the side of the boat and adapted to release said body when the boat is overturned, for the purpose specified.

The combination with a boat, of a buoyant body, arms hinged at one end to the boat at a point below said body and adapted to swing outwardly from the boat, and said arms supporting said buoyant body at their upper ends, and arms or clips hinged at one end to the boat, weighted at their opposite ends and confining the buoyant body in a position adjacent to the side of the boat and adapted to release said body when the boat is overturned, as and for the purpose specified.

The combination with a boat, of a buoyant body, arms hinged at one end to the boat and having loops at their opposite ends through which the said buoyant body passes, and arms or clips hinged at one end to the boat and curved or bent so as to embrace the buoyant body and hold it adjacent to the side of the boat, and

carrying weights at their opposite ends, as and for the purpose specified.

The combination with a boat, of an elongated inflatable tube, a valve therein, arms hinged at their lower ends to the boat and terminating at their upper ends in loops through which said tube passes, the latter lying below the upper edge of the boat, arms hinged at their upper ends to the boat and being curved outwardly and inwardly so as to embrace the said tube, and weights at the lower end of the said latter arms.



No. 25,159. Pleasure Boat. William H. Mullins, Salem, O. Filed January 6, 1895. Term of patent 3 1/2 years.

TRADE AND INDUSTRIAL NOTES.

The Board of Supervising Inspectors of Steam Vessels; at its annual meeting in January, 1896, approved of coil and pipe boilers presented by the following named persons and firms: Wm. H. C. Lyons, Philadelphia, Pa.; Samuel M. Gray, Providence, R. I.; Isaac E. Shepardson, Providence, R. I.; C. R. Benton, Vergennes Vt.; A. W. Finlayson, Detroit, Mich.; T. W. Godwin & Co., Norfolk, Va.; Geo. L. Whittington, Sea Isle City, N. J.; Chas. P. Willard & Co., Chicago, Ill.; Wm. Oldman, Jr., Buffalo, N. Y. (Horizontal and Vertical Boilers); Rochester Machine Tool Works, Rochester, N. Y. (Buckley Patent Water Tube Pipe Boiler); Joseph Provencher, East Providence, R. I.; E. N. Drouillard, Wyandotte, Mich. (Drouillard Water Tube boiler No. 1); John Mohr & Sons, Chicago, Ill.; W. Herbertson, Cadwalader, Pa.; William E. Plummer, Jr., Buffalo, N. Y.; R. Weston & A. M. Lemke, Saginaw, Mich.; Baylies C. Clark, New York, N. Y.; L. W. Loomis, Carrollton, Ill.; J. F. Craig, Toledo, Ohio, (Craig Water Tube Boilers Nos. 1 & 2); Geo. E. & Chas. A. Painter, Pittsburgh, Pa.

The Globe Iron Works, Co., of Cleveland, has installed in its foundry a Whitling cupola of 14 tons hourly capacity.

Vessel agents and others interested in maritime matters are greatly pleased at the blue prints issued recently by W. H. Singer, proprietor of the Singer Tug line, which indicate the channels and all of the freight houses, docks, elevators and mills in Duluth and Superior harbors.

AN INEXPENSIVE BUT EFFECTIVE PUMP.

An advertisement appearing in another column calls the attention of Readers of the RECORD to the merits of the Vandusen Steam Jet Pumps. These pumps are unique yet simple in design, being so constructed that when placed in position for regular duty they cannot retain water while not at work, and hence cannot freeze up in the coldest weather. Being made of brass, they will not crack or break because of extremes of temperature, and will stand greater strain and will not rust. They will always be found ready for work and need no watching nor constant looking after; when put in place, it is only necessary to put on steam and it starts to work, and turning off steam will stop it. This pump is used for many different purposes; in wells, pits, quarries, mines, river and lake sides, tube wells, in tanneries, mills, factories, on steamships, tugs, ferry boats, etc. As they operate in conformity to the law of nature, with steam as the active agent, inquirers are assured of an absolutely reliable pump at all times. Thousands of them are in daily use, not only in the United States, but in at least twelve foreign countries, Australia, Hawaii, Japan, India, South Africa, Cuba, W. Indies, and in Mexico, and Central and South American countries, and everywhere they give full and entire satisfaction. The price is low, and the setting up simple. The cost ranges from \$7 for the smallest size, up to \$75 for the largest size, which will elevate from 10,000 to 15,000 gallons of water per hour to any height not exceeding 50 feet, vertically assured. Where the height exceeds 50 feet, but not over 100 feet ft., then two pumps are used one above the other. The E. W. Vandusen Co., Cincinnati, O., will send a price list and illustrated catalogue free.

NEWS AROUND THE LAKES.

CHICAGO.

THE ASSOCIATION OF MASTERS AND PILOTS PREPARING TO BRANCH OUT ON THE LAKES—A DULL GRAIN FREIGHT MARKET.

Special Correspondence to The Marine Record.

CHICAGO, Feb. 18, 1896.

At a meeting of Chicago Harbor No. 33 of the American Association of Masters and Pilots, held last Thursday afternoon, Capt. James O. Wood was elected and installed as captain, and Capt. George Tebo was elected grand district captain for the lakes, with power to organize new harbors at lake ports.

The American Association of Masters and Pilots will give a social card party at their hall over LeGrande Hotel, on Saturday evening, February 22.

The members of the Ship Masters' Association will give a social card party at their hall over LeGrande Hotel on Monday evening, February 24.

The Dunham Tug Co. towed the steamer Ionia to the Danville elevator and the steamer Nahant to the Minnesota elevator.

The Independent Tug Line towed the schooner Wadena to the Iowa elevator; the schooner Michigan to Miller Bros.' dry-dock.

The steamer Kaliyuga, lying in winter quarters in Illinois Central Slip C, caught fire from an overheated stove in the kitchen in the after cabin on Friday at noon. The Independent Tug Line's tug C. H. Charnley, with her steam pump and hose extinguished the fire before the arrival of any assistance from the city fire department. The steamer sustained damage to the extent of about \$500.

The schooner Lake Forest has been transferred from Hitchcock & Hinds to Hinds & Son, of Chicago.

Capt. W. S. Mack, of Cleveland, arrived here Monday morning to look after his fleet of steamers and schooners in winter quarters here, comprising the steamers George W. Roby, V. H. Ketchum and P. P. Pratt, and schooners Wadena, Wm. D. Becker and Annie M. Ash. All his steamers are loaded with grain and the Wadena is at the Iowa elevator loading.

Capt. William Young, of Cleveland, has been here all the winter looking after Capt. Mack's fleet.

Charters have been made this week at 2c on corn to Buffalo, including winter storage. Receipts of corn here are very small. Large quantities of that cereal is being sent to New Orleans from Kansas, Illinois and Nebraska. It is being exported from New Orleans in vast quantities on the cotton carrying fleet; which have their holds filled with cord and carry the cotton between and on their decks.

Johnston Bros., Ferrysburg, Mich., have contracted to build a marine fire box boiler 7 feet 3 inches diameter, 12 feet long, to be allowed 175 pounds steam pressure, for the Dunham Towing and Wrecking Co.'s tug Mollie Spencer.

The damages to the steamer Kittie M. Forbes recently amounted to about \$500, including docking; 2,021 bushels of corn was also wet.

Capt. Alpha Simmons aged 67 years, died at his residence, 573 Claremont avenue, Chicago, Wednesday, February 12, of heart failure. His funeral took place Friday morning, February 14, at Forest Home cemetery under the supervision of Ship Masters' Association No. 3, of Chicago, of which he was a member, and of which he was recently elected chaplain. Many members of the association and marine men attended the funeral. The deceased leaves a widow and grown son and daughter.

WILLIAMS.

PORT HURON.

RIVER AND LAKE FULL OF ICE AND WEATHER INTENSELY COLD—SUDDEN DEATH OF A PROMINENT SHIP MASTER.

Special Correspondence to The Marine Record.

Port Huron, Feb. 18, 1896.

Capt. R. P. Thompson will open an office in the Grummund Block foot of Butter St. and manage the tugs of Thompson Line.

The jury in the case of John Cornwall against Daniel N. Runnells brought in a verdict of "no cause for action." At a sale under the Maritime Court of Canada at Sarnia in 1891, Runnells bid in the tug Mystic and Cornwall claims there was a verbal agreement between them that he should have a half interest in her, though he put up no money. Runnells denied making any such agreement, and Cornwall brought suit for \$3,000 with the above result.

The Tunnel City Boiler Works, Al Scofield, manager, have several orders for new work but are somewhat delayed on account of a car load of iron going astray between Pittsburg and here. They have a gang of men at work repairing the boiler of the steamer Gogebic at Chicago.

The river continues full of ice and the ice in Lake Huron extends as far as the eye can see. The temperature Sunday night was 9° below zero.

Capt. Cummins Geel dropped dead at his residence last Thursday. He had been in good health up to within a few minutes before he died. He was buried in Lakeside

Cemetery under the auspices of the Ship Masters' Association, of which he was a prominent member.

Capt. John Symes is much improved in health and it is hoped that he will be able to take command of his boat when the season opens.

Ed J. Kendall has 600 names to his petition for the establishing of a life-saving station at the foot of Lake Huron and has good encouragement from our Congressman that it will go through.

KENDALL.

BUFFALO.

COAL SHIPPERS NOT READY TO DO ANYTHING YET—A BRIDGE DRAW THAT WAS MEASURED TOO LATE—GOSSIP OF INTEREST.

Special Correspondence to The Marine Record.

BUFFALO, Feb. 17, 1896.

There is no stir in business yet, except that some of the ship stores are beginning to lay in stock. They report that they are selling very little yet and do not expect much custom for a month or so.

The coal shippers are surprising each other by the apparent inattention they are giving business. At this time of the year it is common for them to have 200,000 tons of hard coal in stock here, but it is thought that there is scarcely more than half the amount laid down yet all told, and no one seems to be in any hurry. There is nothing against a good demand for water coal next season, but the tremendous amount of rail coal that has been rushed into Chicago this winter, most of it on the apprehension of higher rates when the new rail combination went into effect. Some of the companies will have none left in Duluth and little in Milwaukee, but they do not like to predict the condition of things in Chicago on the first of May. Not a word is said yet of opening rates.

Winter navigation of Lake Erie seems to be much in line with that of Lake Michigan and much interest will be felt here till it is known whether the Shenango No. 1 is off the shore of Port Dover where she was driven by the gale of last week Tuesday. It remains to be seen if the \$1,000 demanded by the Buffalo tug men for sending their tugs to her was excessive, as the owners of the car ferry thought. With this sudden freeze up on our hands it is quite likely that the tugs would have been caught outside till a heavy thaw came, whether the boat was released or not, all of which risk the tug men would have had to take, and that probably with no insurance.

When the Shenango No. 2 broke her wheel it was proposed to bring her to Buffalo for repairs, but nobody thought that she would go through the bridge below the dry-docks. Even the city authorities had nothing to show that there was more than 52 feet clear space in the draw. After she had been sent to Toledo it was found on measuring that there was a good 58-foot opening.

When some one laid up the excursion steamer Shrewsbury against a sloping bank at the foot of Genesee street, he showed poor judgment. The boat was soon crowded on the bank by the wind and when the water went down she keeled over. Hingston & Woods are trying to get her afloat, but are experiencing rather more than the usual difficulty. Once they had her afloat, but the pumps gave out and she went down. Then they proved too small at the critical moment, and she got away again. The capsizing of the boat has strained her badly, making a ragged line of opening very hard to patch.

Work on the Queen of the West is progressing very favorably. Her engine—taken from the lost Calumet—is in, and she is receiving considerable new upper works. The Rube Richards, which lies alongside her below Commercial Slip, is not so far under way. The new boiler—from the lost Newburg—is not yet in and will not be ready to be shipped for some time.

People do not realize the littleness of any but the more modern shipping till comparisons are made. A most erroneous idea is obtained from the stirring accounts of sea flights, whether Nelson or Commodore Perry was the particular hero. Mr. Charles Marshall, of Smith, Davis & Co., showed me a paper published in 1825 that gives an advertisement of the ship "Colossus," Capt. Marshall, which was to sail from Philadelphia, then the principal American seaport, on August 20th of that year. The Colossus was a big ship for those days, though she measured only 399 tons, a mere canal schooner size, but it was an event when she left port and the occasion was made a holiday with processions and a band of music. Capt. Marshall was Mr. Marshall's father, who made a fine record in those already far-off days 70 years ago.

The ship-brokerage office of John L. Crosthwaite took flight across the street a day or two ago. A case of diphtheria was discovered in the building, and temporary quarters were obtained in the office of the Northern Steamship Co.

The lake-line managers are still struggling over their combination for the season. An important meeting is set down for Wednesday.

Very little vessel movement now takes place in the harbor, though the ice nearly disappeared last week. The Anchor Line steamer Conemaugh went into dry-dock last Wednesday for some new keel and a rudder stock.

Manager Evans, of the Anchor Line, takes a trip abroad this week, sailing from New York for Europe on Wednesday.

The Northern Steamship Co.'s office will begin to scatter soon. The auditor's department is expecting orders to leave for Duluth any day. Mr. Murray goes up town here with Traffic-Manager Clark. Marine Superintendent Brown, who has been laid up for a week, is out again. It is to be hoped that the Northern Co. has not bitten its nose off to spite its face in running away from Buffalo on account of a dock squabble.

JOHN CHAMBERLIN.

DULUTH AND SUPERIOR

MCCORD LUMBER CO. EXTENDS ITS DOCKS—MORE CARS FOR ORE—SUPPLY OF GRAIN IN STORE.

Special Correspondence to The Marine Record.

DULUTH, Feb. 18, 1896.

The McCord Lumber Co. has let to J. J. Gillman & Co. the contract for the construction of two lumber docks, to be erected alongside the lumber mill on the bay front near the gas works. The docks will be used for storing lumber—one for the green product, and the other for that which has been seasoned ready to ship. The two docks will cost about \$15,000. The completion of these docks will give the McCord Lumber Co. the best storing facilities at the head of the lakes.

The Duluth, Mesaba and Northern Railway has just placed an order for 600 new ore cars. This company bought 200 new cars last year.

There is no more grain being loaded now, the amount of wheat afloat being 512,000 bushels, in addition to this there is stored among the various terminal elevators 10,712,000 bushels of wheat, an increase of 798,935 bushels during the week. It is divided as follows: Belt Line, 1,269,229; Consolidated, 3,020,318; Globe, 3,848,577; Great Northern, 775,967; Superior Terminal, 1,411,361; Consolidated B, 258,886; Consolidated H, 128,157. There is 20,093,816 bushels in store at Minneapolis.

Capt. Alexander McDougall, general manager of the American Steel Barge Co., returned from New York last week. Capt. McDougall was urged to visit Washington and appear before the House Rivers and Harbor Committee in the interest of Duluth-Superior harbor appropriations, but owing to pressing business at home could not do so. It is understood that he will leave for San Francisco shortly in the interest of the barge company. When asked as to the company's plans for the coming year Capt. McDougall said:

"I cannot make my detailed statement of the company's plans for the immediate future, but I can say that we shall be actively engaged upon vessel construction, both for ourselves and for others, for a year at least. I am not at liberty to go into details at present, but we have considerable work at the shipyard to be accomplished within the next twelve or fourteen months."

The future for shipping interests were never brighter here and an early opening of navigation is predicted by vesselmen. Three new railroads are to come into Duluth. The Merritts are now surveying for a road to compete with the Duluth, Mesaba & Northern for the iron ore business in the Mesaba range. The Hines road through the Red River valley is progressing rapidly and now comes news of a movement to build a road from Alexandria, Minn., to Duluth. The route is through a most fertile part of the state and the line runs through a territory not traversed by any other line.

R. D. STRONG.

EXCHANGES.

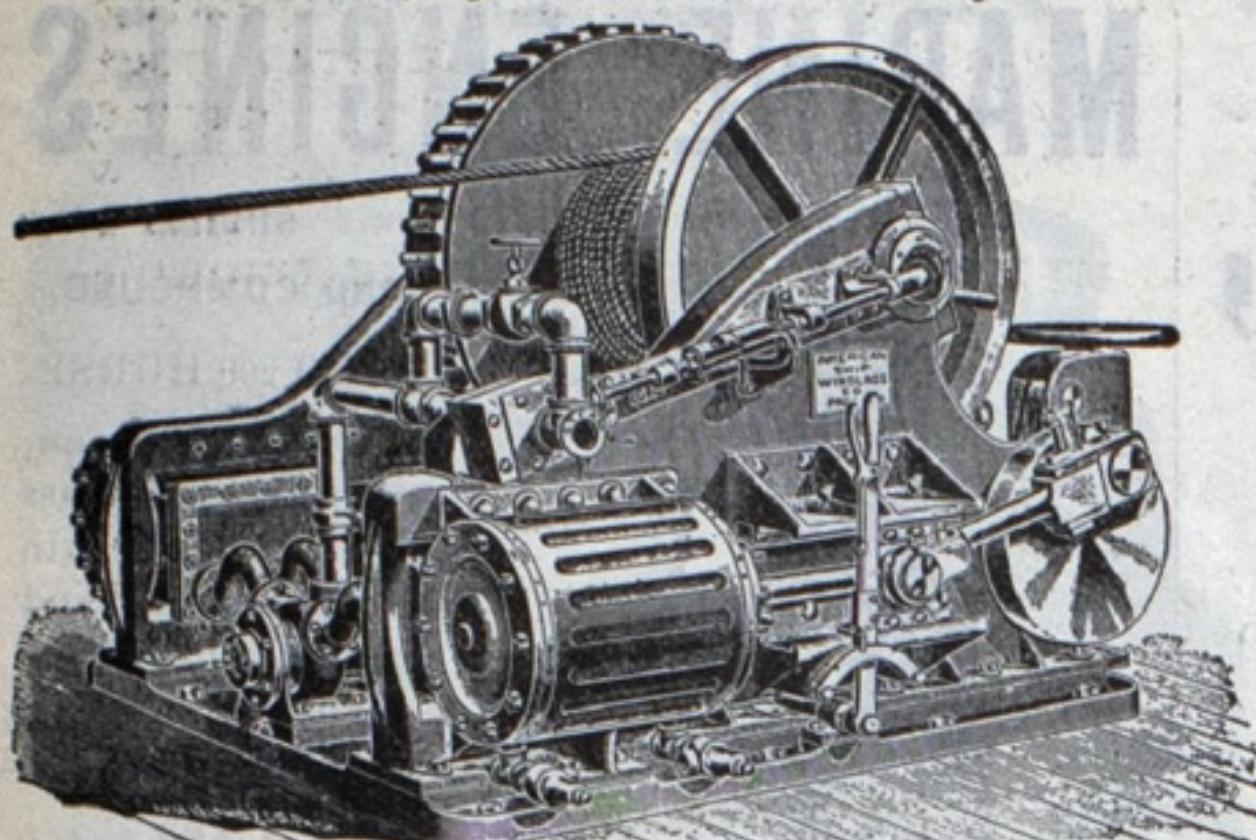
One of the more noteworthy articles in the March number of Harper's will be Professor Woodrow Wilson's sketch entitled "Colonel Washington," "Arcadian Bee-Ranching," by Owen Wister, "Jane Hubbs's Salvation," by Mrs. Helen Huntington; "The 'Boss' of Ling-Foo" by Julian Ralph; and "The Nerves of a War Ship," by Park Benjamin, will also appear in this number—together with installments of the serials "On Snow-Shoes to the Barren Grounds," "Briseis," "Personal Recollections of Joan of Arc," and the "German Struggle for Liberty."

Richard Whiteing, long a leading editorial writer of the London Daily News, has written for the March Scribner's an article on "British Opinion of America," in which he says "President Cleveland has builded better than he knew with the famous message. He has compelled us on both sides of the Atlantic to revise our judgment of each other." This article is noticeable as almost the first one to give the opinion of the Man of the Street and the great body of working people.

It has been learned on good authority that a number of prominent men interested in the welfare of the canal and of the port of New York are seriously considering the organization of a company to construct a fleet of modern canal steamers and consorts, with a view of conducting the business of the canal on business principles.

Canada threatens to pass more stringent laws to prevent alleged evasions by American fishermen.

The Shaw & Spiegel Patent Steam Towing Machine.

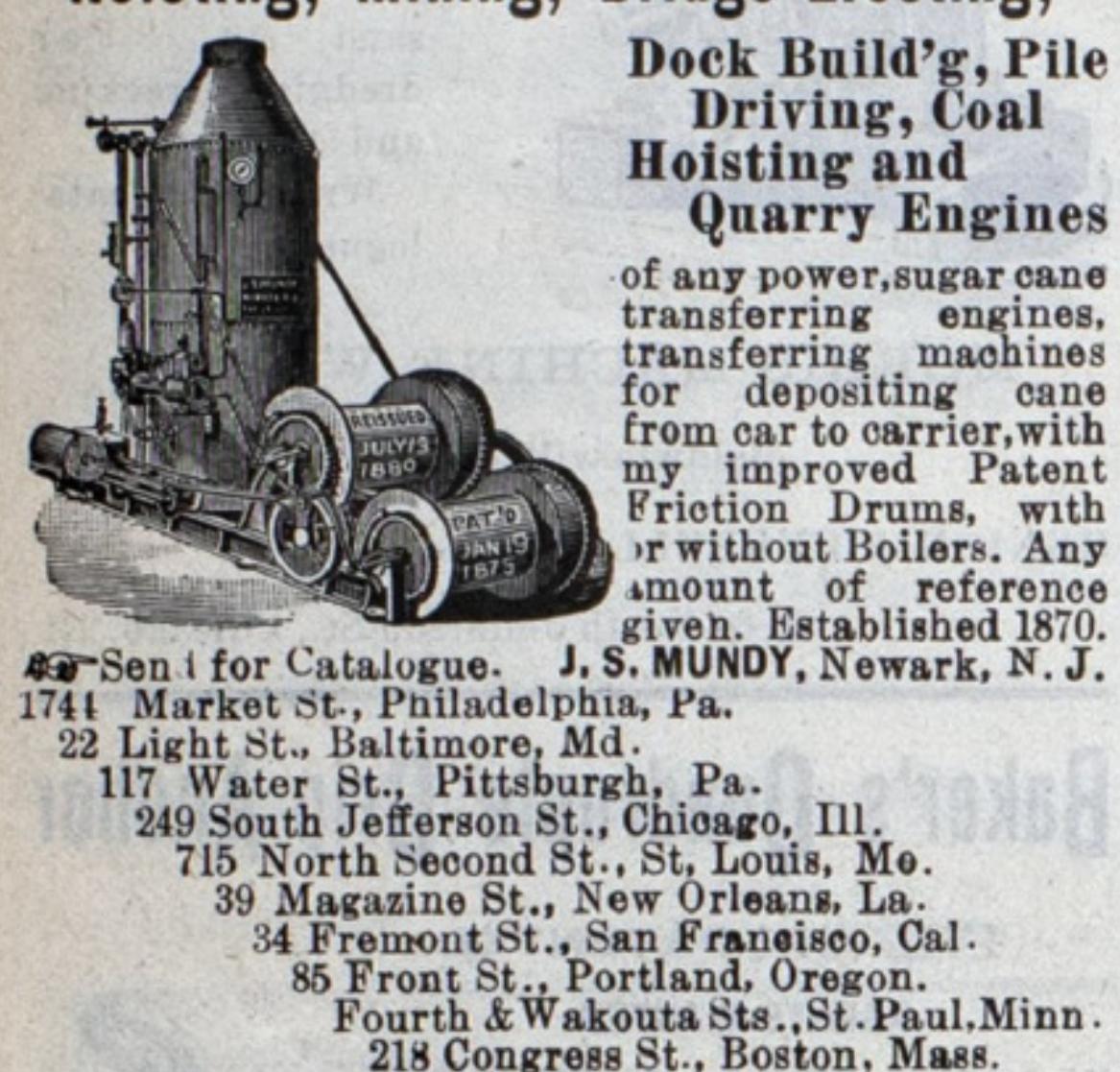


Patented June 5, 1888, and July 16, 1895.

Hoisting, Mining, Bridge Erecting,

Dock Build'g, Pile
Driving, Coal
Hoisting and
Quarry Enginesof any power, sugar cane
transferring engines,
transferring machines
for depositing cane
from car to carrier, with
my improved Patent
Friction Drums, with
or without Boilers. Any
amount of reference
given. Established 1870.

Sen for Catalogue. J. S. MUNOY, Newark, N. J.
174½ Market St., Philadelphia, Pa.
22 Light St., Baltimore, Md.
117 Water St., Pittsburgh, Pa.
249 South Jefferson St., Chicago, Ill.
715 North Second St., St. Louis, Mo.
39 Magazine St., New Orleans, La.
34 Fremont St., San Francisco, Cal.
85 Front St., Portland, Oregon.
Fourth & Wakouta Sts., St. Paul, Minn.
218 Congress St., Boston, Mass.



...American

Providence, R. I.

Established 1857.

Ship Windlass Co.

SHAW & SPEIGEL PATENT
STEAM TOWING MACHINES,
WITH RECENTLY PATENTED IMPROVEMENTS.

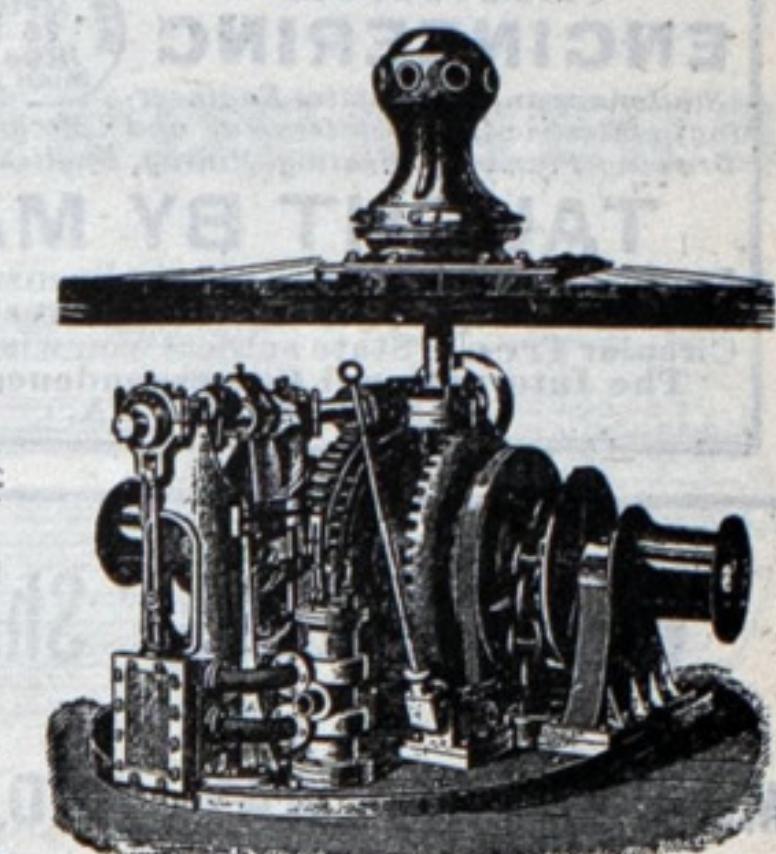
All parties cautioned against infringing these patents.

Send for Circular.

ADDRESS FRANK S. MANTON, AGENT.

The "Providence" Patent Steam

Capstan Windlass.

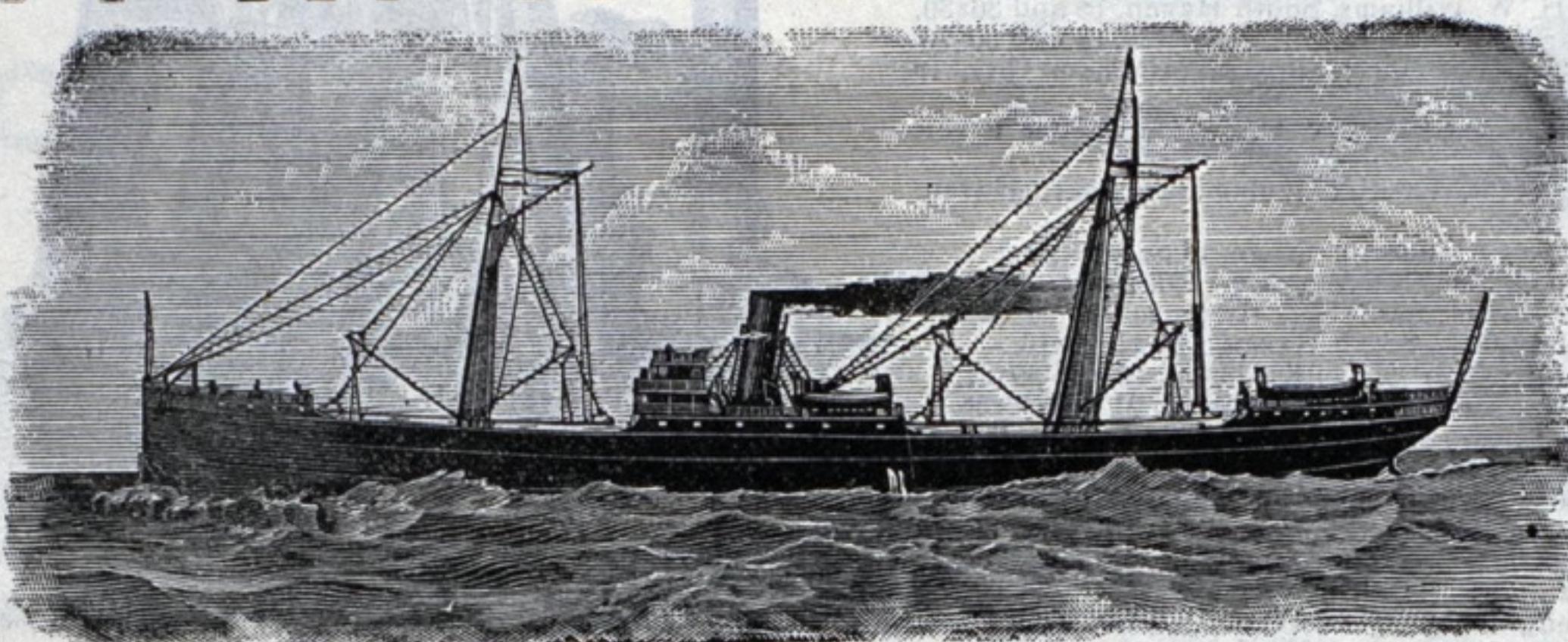


F. W. WHEELER & COMPANY.,

BUILDERS OF ALL KINDS OF

IRON, STEEL AND
WOODEN SHIPS,
FOR LAKE OR OCEAN SERVICE.

West Bay City, Mich.



F. W. WHEELER, Pres. E. T. CARRINGTON, V. Pres.

C. W. STIVER, Secretary & Treasurer.

FRONTIER IRON WORKS,
MARINE ENGINES,
DETROIT, MICH.

INCORPORATED 1794.

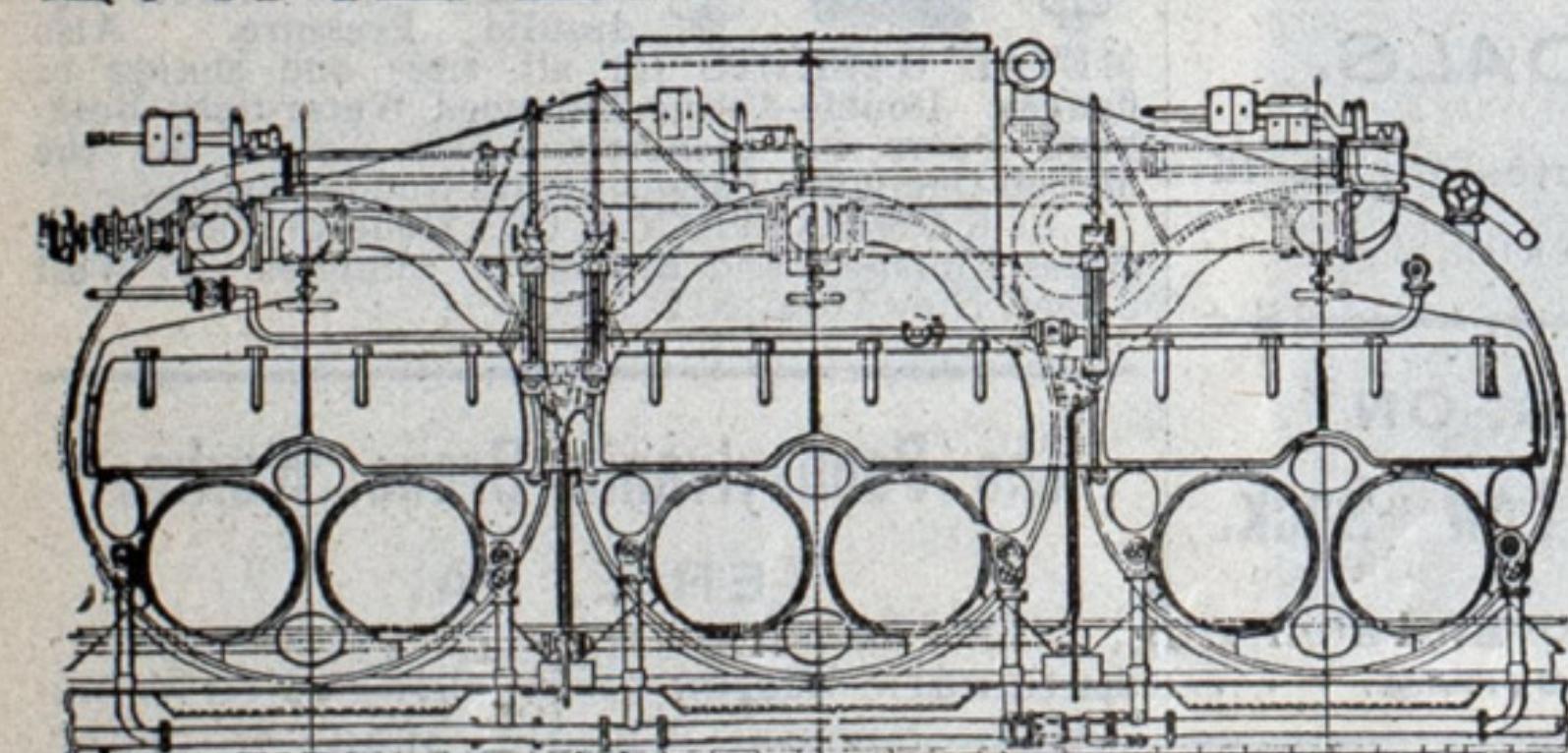
Insurance Company of North America.

CAPITAL, PAID UP IN CASH,
ASSETS.\$3,000,000.00.
9,562,599.92.CHARLES PLATT, President.
EUGENE L. ELLISON, 2d Vice President.
JOHN H. ATWOOD, Assistant Secretary.WILLIAM A. PLATT, Vice President.
GREVILLE E. FRYER, Sec'y and Treas.

Lake Marine Department.

GEORGE L. McCURDY, Manager.
CHICAGO, ILL.

LAKE ERIE BOILER WORKS

The best equipped
plant in America for
the manufacture of
MODERN
MARINE
BOILERS.
BUFFALO, N. Y.

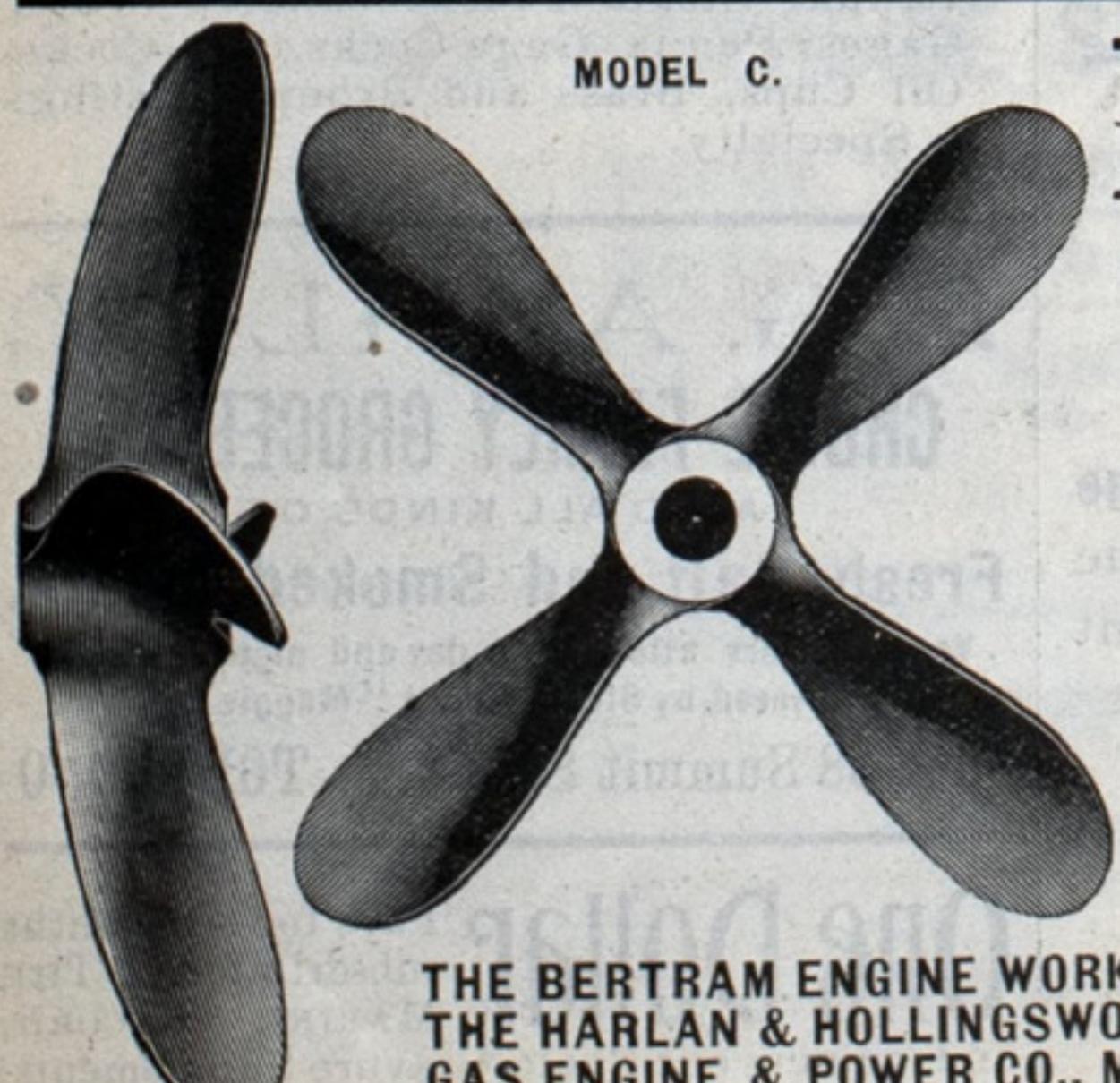
MODEL C.

THE CASE . . .
. . . OUTWARD THRUST

MODEL A, MODEL B, MODEL C, MODEL D, MODEL E.

Propeller Wheels.

MODEL D

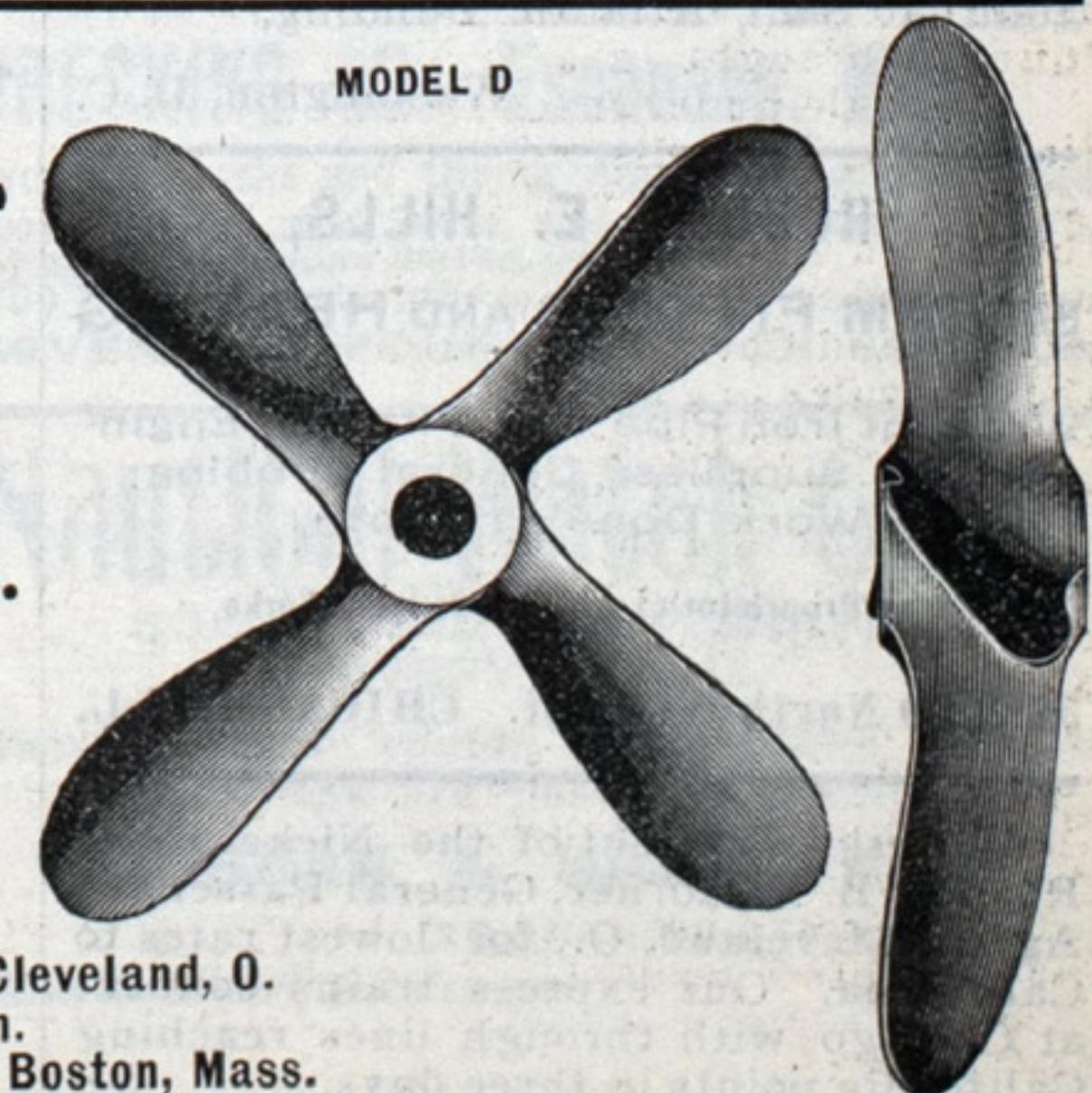
The Speediest, Smoothest Running
and Most Economical Wheels Yet Made.

MANUFACTURED BY A. WELLS CASE, Pattee, Highland Park, Conn.

THE BERTRAM ENGINE WORKS CO., Toronto, Ont.
THE HARLAN & HOLLINGSWORTH CO., Wilmington, Del.
GAS ENGINE & POWER CO., Morris Heights Station, N. Y. City.
MARYLAND STEEL CO., Sparrows Point, Md.THE GLOBE IRON WORKS CO., Cleveland, O.
S. F. HODGE & CO., Detroit, Mich.

THE LOCKWOOD M'F'G CO., East Boston, Mass.

SEND TO PATTEE FOR 1896 CATALOGUE.





Walter H. Oades' Shipyard,
MARINE RAILWAY AND SHEERS,
Ship Carpenters, Calkers & Joiners.
Working on reasonable terms.
Yard: Foot of Dubois Street, DETROIT.
Telephone 1670, 3 rings.

ABRAM SMITH. ANGUS H. SMITH.
ABRAM SMITH & SON,
SHIP-BUILDERS,
ALGONAC, MICH.

Wooden Ships of any description built, rebuilt, or repaired.
Send for specifications, prices, etc.
Good slips for laying up boats.



A. GILMORE'S SONS,
DRY DOCKING,
SHIP BUILDING,
AND REPAIRING.

East Side, Near Ironville, TOLEDO, O.
DIMENSIONS OF DOCK: 236 feet long, 55 feet wide at top and 37 feet wide at gate. Nine feet water over sill.

RATES OF DOCKING: Ten cents per registered gross ton for vessel over 200 tons. Jig Mill and Plainer in connection with Dock.

PHONE NO. 157.

PATENTS, CAVEATS, TRADE-MARKS, DESIGN PATENTS, COPYRIGHTS, Etc.

CORRESPONDENCE SOLICITED.

John A. Saul, Atlantic Building,
Washington, D. C.

ROBERT E. HILLS,
STEAM FITTING AND HEATING

Wrought Iron Pipe and Fittings, Engineers' Supplies; General Jobbing Work Done Promptly.

Also Proprietor of North Side Iron Works.

57 & 59 North Wells St. CHICAGO, ILL.

Address any agent of the Nickel Plate Road or B. F. Horner, General Passenger Agent, Cleveland, O., for lowest rates to California. Our express trains connect at Chicago with through lines reaching California points in three days.

ESTABLISHED 1871.

INCORPORATED 1893.

MONTAGUE IRON WORKS CO.,

MANUFACTURERS OF
Marine and Stationary Engines

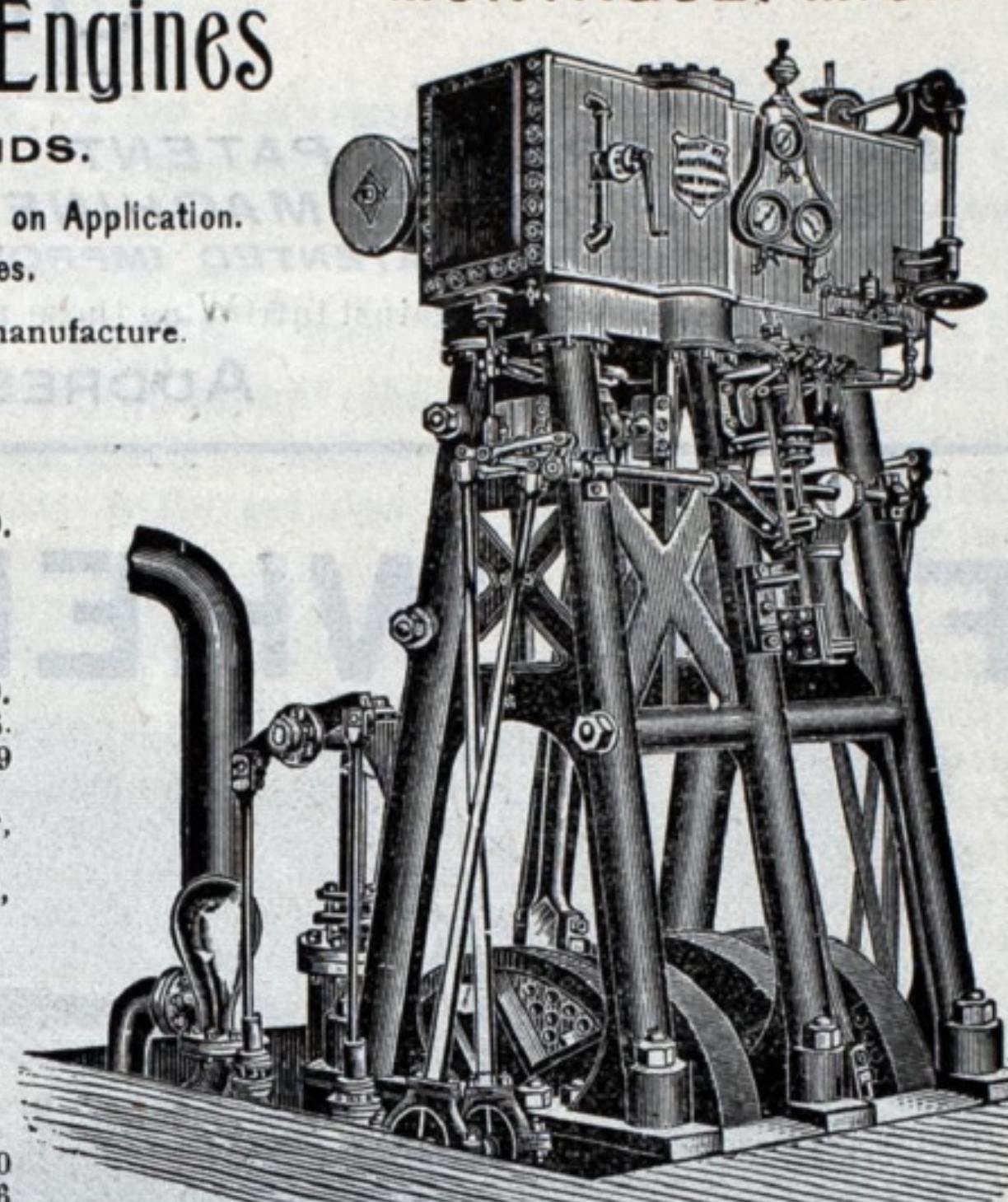
AND BOILERS OF ALL KINDS.

Heavy Castings a Specialty. Prices Quoted on Application.
Fore and Aft Compound Marine Engines.

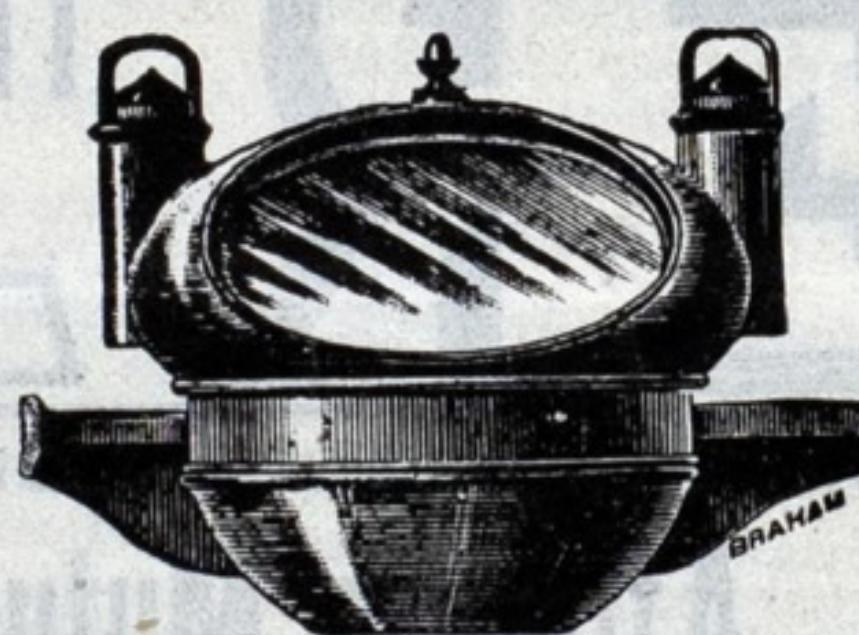
The Engines in the following boats are of our manufacture.

Tug, Hunter, Chicago, 15 and 28x22.
Tug, Tacoma, Chicago, 16 and 30x24.
Tug, Zenith, Duluth, 18 and 36x30.
Steamer Glenn, South Haven, 14 and 28x20.
U. S. Survey Steamer, W. S. Hancock, 12 and 21x20.
Steamer Pine Lake, Charlevoix, 16 and 30x24.
Passenger Steamer Pilgrim, St. Clair, 14 and 28x20.
Steam Barge Iona, Grand Haven, 24 and 46x42.
Steam Barge M. T. Greene, Chicago, 20 and 36x36.
Steamer H. W. Williams, South Haven, 18 and 36x30.
Steam Barge Mark B. Covell, Manistee, 18 and 30x26.
Steam Barge Isabella J. Boyce, Michigan City, 19 and 32x26.
Steam Barge Luella H. Worthington, Cedar River, 19 and 36x30.
Passenger Steamer City of Kalamazoo, South Haven, 20 and 40x30.
Steamer Oval Agitator, Chicago, 14 and 28x20.
Tug E. G. Crosby, Muskegon, 16 and 30x24.
Tug Peter Coates, Sault Ste. Marie, 10 and 20x16.
Steamer Lorain L, South Haven, 12 and 21x16.
Passenger Steamer Lotus, Escanaba, 16 and 30x24.
Steam Barge Sachem, Grand Haven, 21 and 38x36.
Passenger Steamer Bon Ami, Saugatuck, 14 and 28x20.
Steam Barge Charles A. Street, Chicago, 20 and 36x36.
Steam Barge Edward Buckley, Manistee, 18 and 36x30.
Passenger Steamer E. G. Maxwell, Pentwater, 14 and 28x20.
Passenger and Freight Steamer Bon Voyage, Saugatuck, 16 and 30x26.
Passenger and Freight Steamer Mabel Bradshaw, Muskegon, 16 and 28x26.

The engraving represents our 20 and 36x36 Fore and Aft Compound Marine Engine. We build them all sizes and guarantee them to give satisfaction. Prices furnished on application.



MONTAGUE IRON WORKS CO., Montague, Mich.



FRANK MORRISON, COMPASS ADJUSTER

AND MANUFACTURER OF
NAUTICAL INSTRUMENTS.
COMPASSES, BAROMETERS, PATENT LOGS, BINNACLES, STEAM GAUGES, MARINE GLASSES, ENGINE INDICATORS.

All Nautical Instruments Carefully Repaired.

Office with Upson, Walton & Co., 161 River St., Cleveland, O.

THE CUDDY-MULLEN COAL COMPANY
DEALERS IN COAL.

Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.

All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick, and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, Ohio. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg and Sandwich, Ontario.

MULLEN-GATFIELD COAL CO.

Dealers in the Celebrated

MANSFIELD AND YOUGHIOGHENY COALS.

Docks at SANDWICH, ONTARIO, opposite the Fort at Detroit, with chutes for rapid fueling. Elevated docks and derrick at AMHERSTBURG, ONTARIO.

O. W. SHIPMAN DOCKS.

AMHERSTBURG, ONT.

Four Chutes and Low Dock.

Massillon and KOAL Youghiogheny

and Hocking . . .

Main Office, 90 Griswold St., DETROIT.

**TIME AND PLACE
TO ADVERTISE**

Now and in Beeson's Inland Marine Directory is the time to order, and the place in which to put an advertisement of your business for 1896.

FOR TERMS ADDRESS

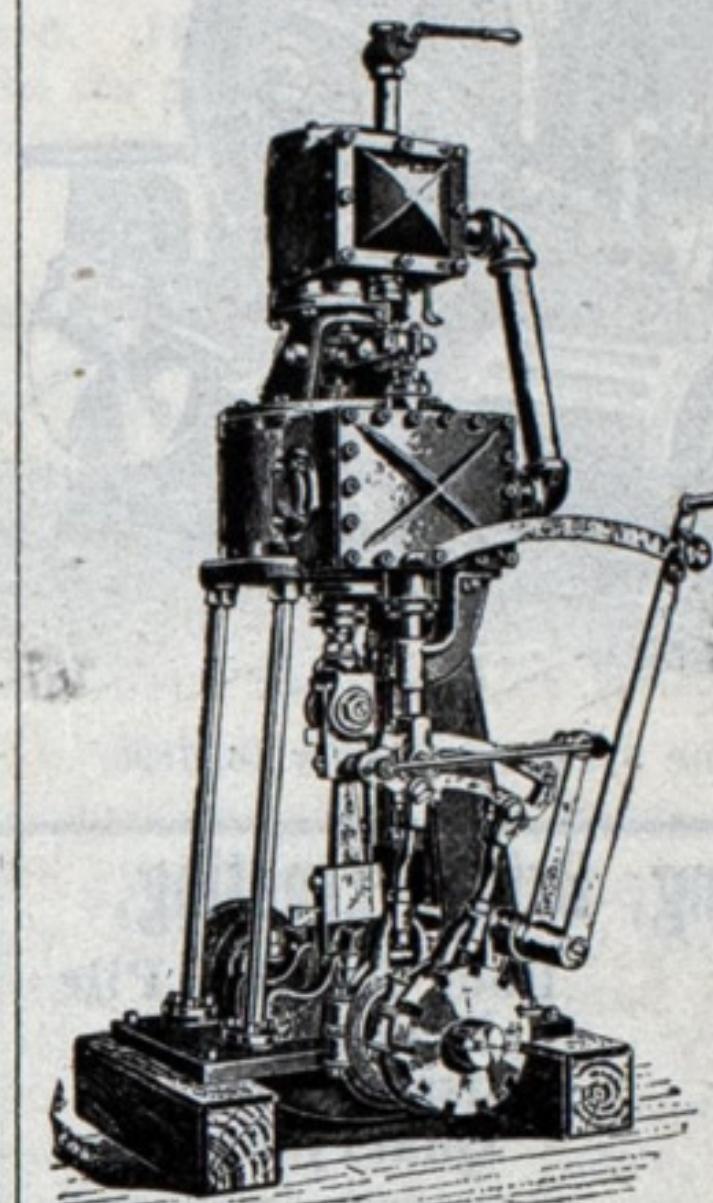
H. C. BEESON,

308 Royal Insurance Bldg., CHICAGO, ILL.

MARINE ENGINES

SINGLE
AND COMPOUND.

5 TO 200 HORSE POWER. These engines are high-class in workmanship and material and moderate in price. Send for cuts, description and prices.



**Centrifugal
Pumps**

For raising coal, sand, &c. For dredging, wrecking and circulating.

Write for catalogue.

MORRIS MACHINE WORKS,

Baldwinsville, N. Y.

HENION & HUBBELL, Agents.

61-69 North Jefferson St. Chicago, Ill.

Baker's Quadruple Grip Anchor

PATENTED.

AGENTS WANTED.

Watertown Brass & Mfg. Co.,
WATERTOWN, N. Y.

Send
Stamp for
Catalogue.



Mfrs. Yacht, Boat and Canoe Hardware. Special Work a Specialty. Boat Rails, Stanchions, Etc.

MENTION THIS PAPER.

Katzenstein Self-Acting Metal Packing

for Piston Rods, Valve Stems, Etc., of every description, for Steam Engines, Pumps, Etc. Adopted and in use by the principal Iron Works, Steamship Companies, Mills and Engine Builders, Electric Light and Power Plants within the last twelve years in this and foreign Countries. Also FLEXIBLE TUBULAR METALLIC PACKING for Slip-Joints on Steam Pipes and for Hydraulic Pressure. Also METAL GASKETS for all sizes and shapes of flanges. Double-Acting Balanced Water-tight Bulkhead Doors for Steamers. Also Agents for the McColl-Cumming Patent Liquid Rudder Brake.

L. KATZENSTEIN & CO., General Machinists, Brass Finishers and Engineers' Supplies, 357 West Street, New York, N. Y.

**The Pennsylvania Brass Works,
ERIE, PA.**

Automatic Piston or Mocking Bird Whistles. Special Whistles made to order. Penna. Steam Flue Cleaner. Water Gages, Penna. Gage Cocks, Air Cocks, Oil Cups, Brass and Bronze Castings a Specialty.

**E. G. ASHLEY,
CHOICE FAMILY GROCERIES.**

ALSO ALL KINDS OF

Fresh, Salt and Smoked Meats.
Vessel orders attended to day and night. Goods delivered by Steam Yacht "Maggie D."

36 & 38 Summit Street. TOLEDO, O.

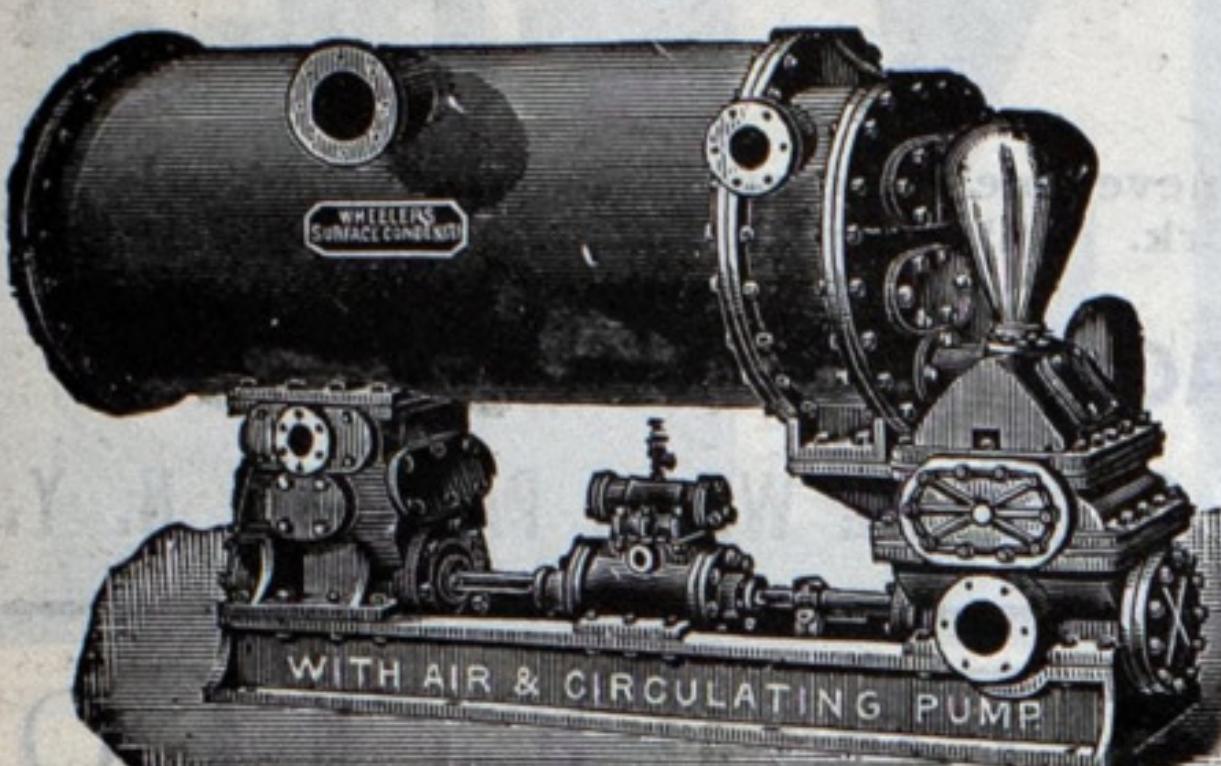
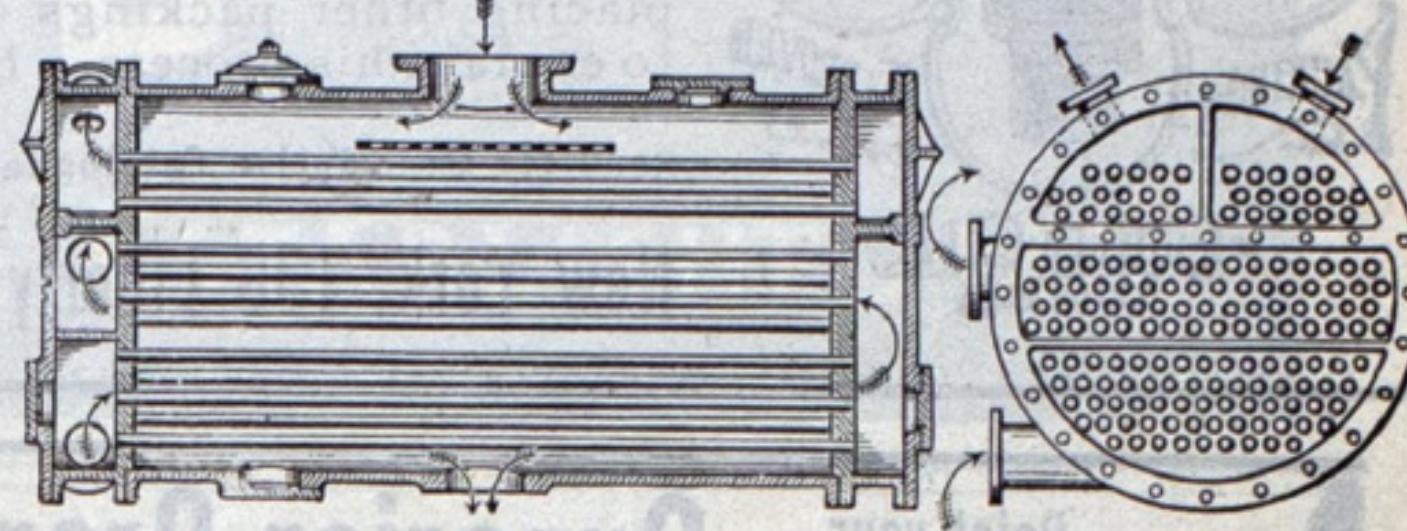
One Dollar Pays for six months subscription to THE MARINE RECORD, and includes our Photo-Gravure Supplements.

Wheeler Condenser & Engineering Co.,

39 & 41 CORTLANDT STREET, NEW YORK.

WHEELER'S IMPROVED SURFACE CONDENSERS

Mounted upon Combined Air and Circulating Pumps.

WHEELER SURFACE CONDENSER,
Mounted on Combined Air and Circulating Pumps.PATENT COMBINED SURFACE CONDENSER AND
FEED-WATER HEATER.

Sole Proprietors and Manufacturers of the
WHEELER STANDARD SURFACE CONDENSER.
WHEELER ADMIRALTY SURFACE CONDENSER.
WHEELER LIGHT HALL SURFACE CONDENSER.
VOLZ PATENT COMBINED SURFACE CONDENSER AND
FEED-WATER HEATER.
WHEELER FEED-WATER HEATER, AIR AND CIRCULATING
PUMPS.
EDMISTON PATENT FEED WATER FILTER.

Send for Pamphlet, "Machinery for Small Boats, etc."

P. M. CHURCH & CO.

SAULT STE. MARIE, MICH.

Ship Chandlery, Hardware, Paints, Oils,

And all classes of

VESSEL SUPPLIES.

Coppersmith Shop in connection.

Corner Portage and Ashmun Sfs.

TELEPHONES: - OFFICE NO. 7.
RESIDENCE NO. 4.

Eight Elegant . . .

PHOTOGRAVURES

SIZE, 10 x 17 INCHES.

Whaleback Steamer Christopher Columbus,
STATE of OHIO—STATE of NEW YORK,

Steel Ship Builders,

Steamer ARTHUR ORR,

English-Built Steamer TURRET,

Dry Dock Representatives.

Schooner JOHN FITZPATRICK.

Complete set mailed to any address on
receipt of 25c.SMITH & SMITH,
144 Superior Street, CLEVELAND, O.

BUFFALO HARBOR CHARTS . . .

Containing full information regarding

BUFFALO, BLACK ROCK AND TONAWANDA HARBORS

Also all Canals, Slips and Basins, together with Directory giving location of various business houses. For sale by

THE MARINE RECORD,
144 SUPERIOR ST., CLEVELAND, O.
PRICE \$2.00 EACH.

J. J. KEENEN, RIVERSIDE STEAM BOILER WORKS.

Marine, Locomotive and Stationary Boilers.

Marine Work a Specialty.

SHEET IRON WORK OF ALL KINDS.
REPAIRING PROMPTLY ATTENDED TO.

Office and Works, Cor. Cologne and Fuller Streets,

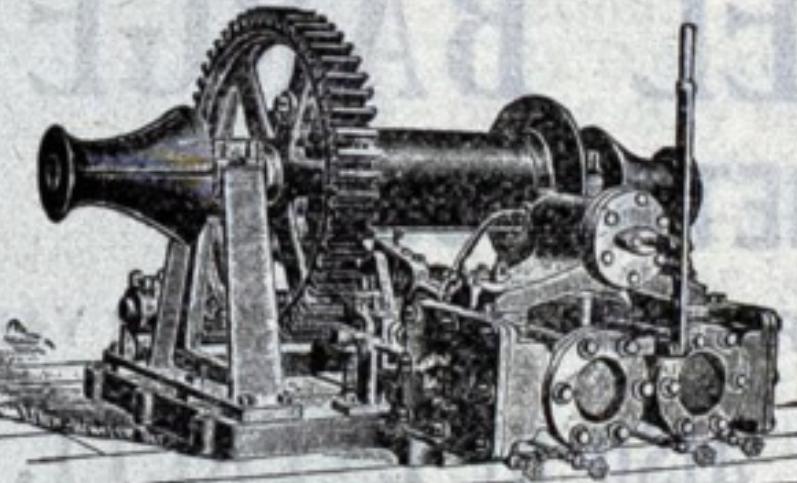
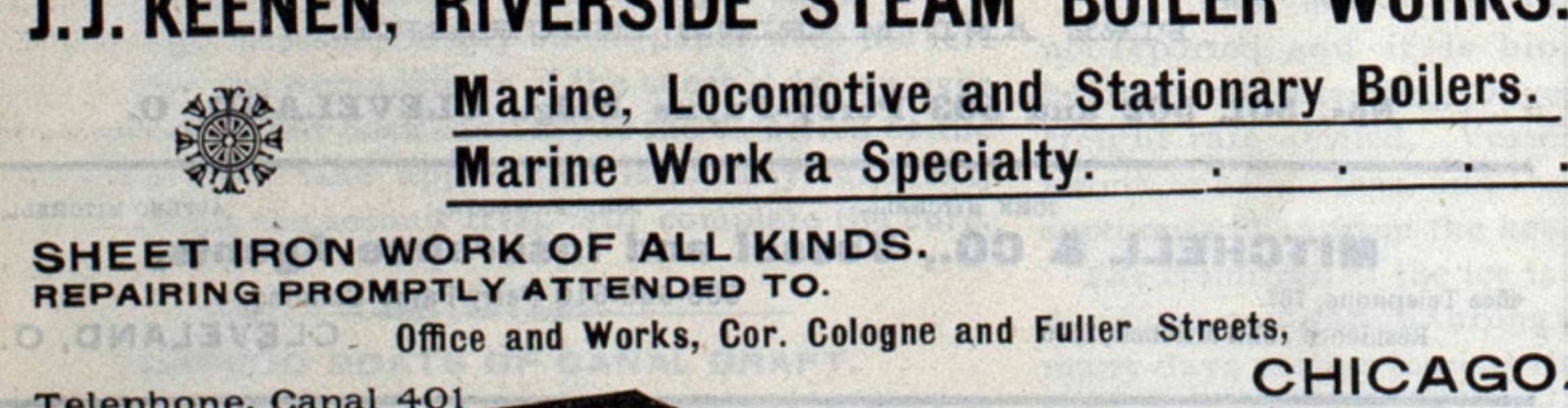
CHICAGO.

Telephone, Canal 401.

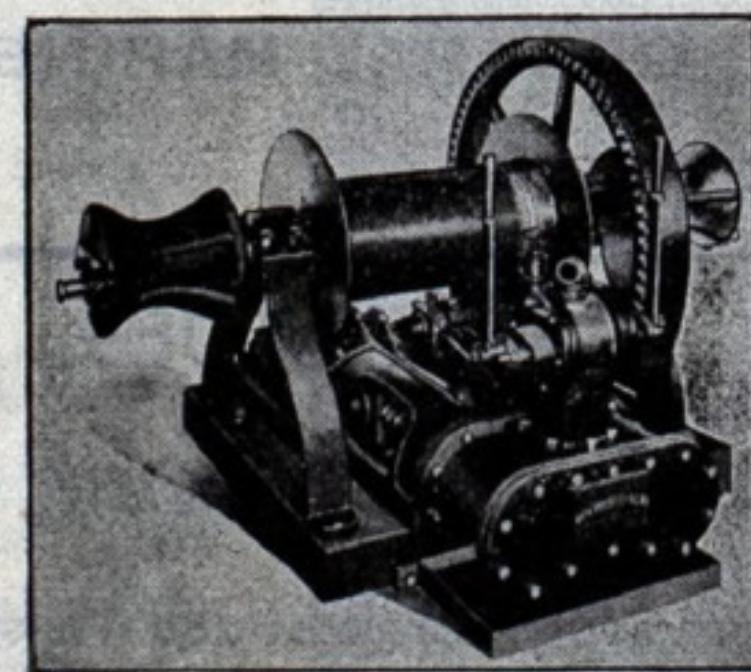
JEFFERY'S MARINE GLUE

For Paying Seams of Decks and other Purposes.

L. W. FERDINAND & CO.,

BOSTON, MASS.
SEND FOR CIRCULAR.

BAY CITY, MICH.



DECK HOISTS

- Coal and Contractors' Hoists,
- Steam Steering Gears and
- Conveying Machinery
- For all Purposes.

MANUFACTURED BY W. H. WHITTEMORE,
WEST BAY CITY, MICH.

J. H. OWEN, Prest., Chicago. F. H. VAN CLEVE, Sec'y, Escanaba. Capt. GEO. BARTLEY, Supt., Escanaba.

ESCANABA TOWING & WRECKING CO., Escanaba, Mich.

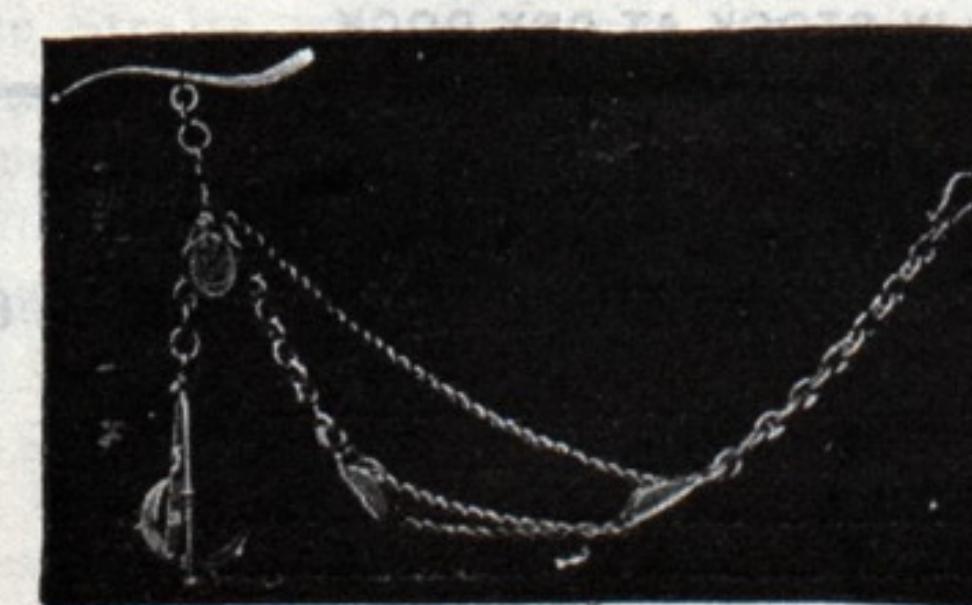
Tugs, Lighters, Steam Pumps, Hawser, Hydraulic Jacks and Diving Appliances always ready

TUG MONARCH—Engine Compound, Cylinder 16 & 30 in. diameter, 30 in. Stroke, Steam Pressure allowed, 125 lbs.

TUG DELTA—Cylinder 20 by 22, Steam Pressure allowed, 105 lbs.

TUG OWEN—Cylinder 20 by 20, Steam Pressure allowed, 104 lbs.

SEVEN AND FOURTEEN INCH SUCTION.



Nautical Watch Chain.

SOLID GOLD. SHIP-SHAPE IN
EVERY DETAIL.Sheaves work, snatch block opens out and
seizings are passed correctly.

MORGAN A. ROBERTSON,

26 John Street, New York.

Send for Descriptive Circular.



CRANDALL'S PATENT PACKINGS,

FOR STEAM, WATER AND AMMONIA.

Not having been subjected to the injurious chemical action of boiling oil, outlast all others, and never melt and gum. We are constantly displacing other packings on Lake and Ocean Steamers, and can guarantee our goods for marine work. Ask the man offering "the same thing", to explain his process. He boils his goods in oil.

Send for Descriptive Catalogue and Samples.

New York, 136 Liberty Street. Chicago, 51 S. Canal Street.

CRANDALL PACKING CO.

Main Offices and Works, PALMYRA, N. Y.

Paint your
Vessels with

Superior Graphite Paint

NO BLISTERING, CRACKING OR SCALING.

Made especially for Stacks, Decks, Sides, Hulls and Water Compartments.
Strictly anti-rust, and most durable and economical.

DETROIT GRAPHITE MFG. CO. 542 River St., Detroit, Mich.

WHITTON & BATES, Agents, 503 Perry-Payne Building, Cleveland, O.

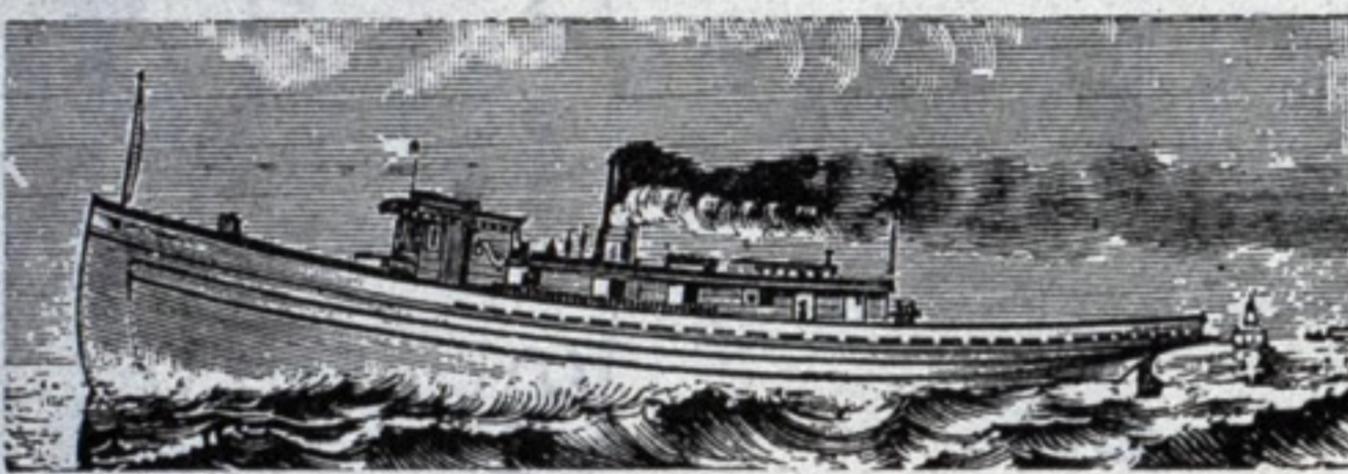
H. A. HAWGOOD, Pres't.
PHILIP MINCH, Vice-Pres't.

GEO. ELSEY, JR., Gen'l Mang'r.

J. A. SMITH, Sec'y.
J. R. SPRANKLE, Treas

The Cleveland Tug Company,

First-class Tugs,
Steam Pumps,
Divers, Hawser,
Lifting Screws,
Etc., furnished
Promptly on
Orders by Tele-
graph or oth-
erwise.



Steamers when
outside wanting
our Tugs, blow
one long whis-
tle and as many
short ones as
they want tugs.

OPEN DAY and NIGHT.
Long Distance Telephone 725.

DOCK and OFFICE FOOT of FRONT ST.
Cleveland, Ohio.

The "CINCINNATI" Automatic STEAM STEERING GEAR

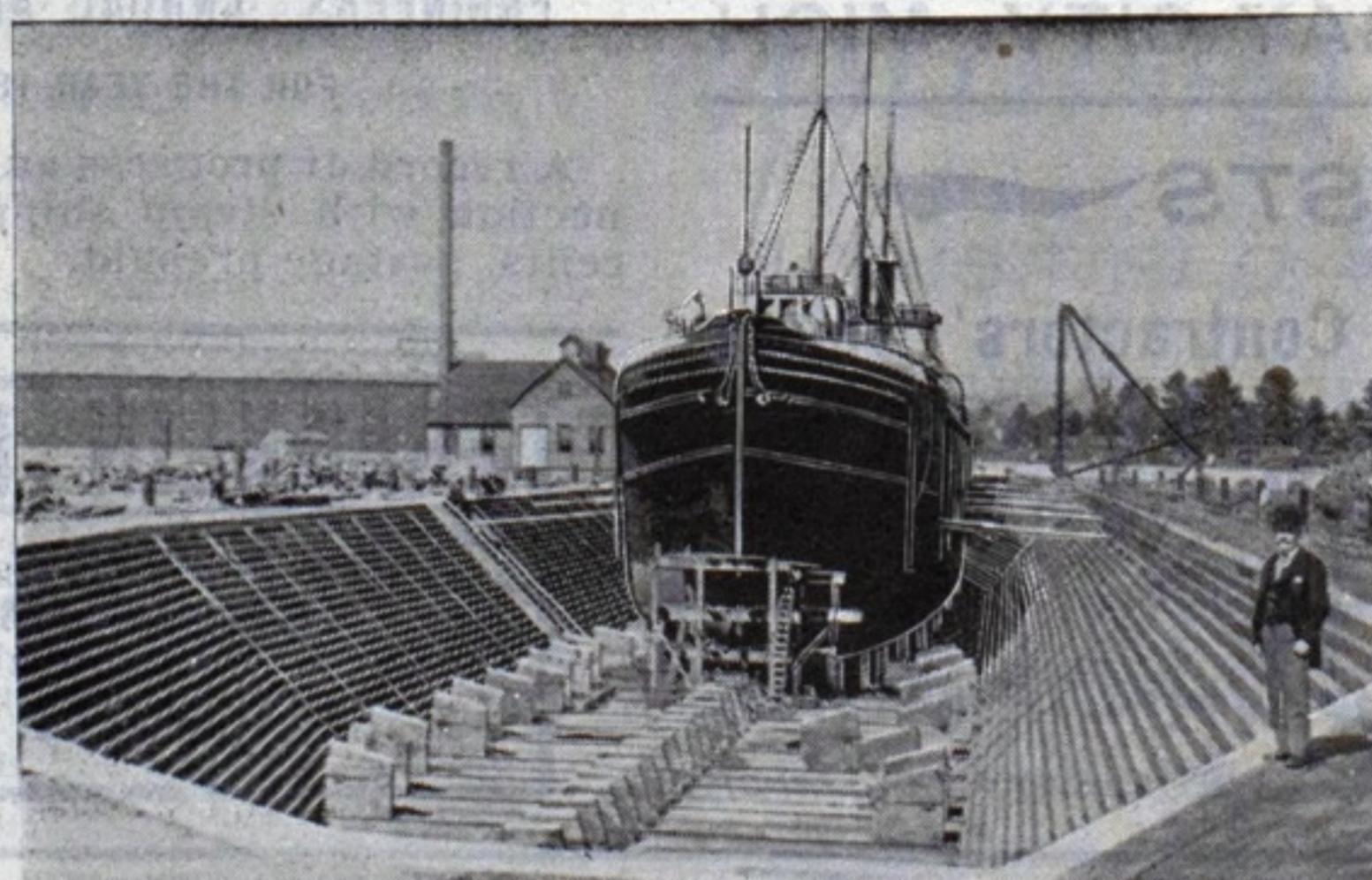
Simple, Powerful Machine. Noiseless and Sure. Send for Circular.
FRONTIER IRON WORKS, Detroit, Mich.,
AGENTS FOR THE LAKES.

AMERICAN STEEL BARGE CO. STEEL AND METAL SHIPS

OF ALL CLASSES BUILT ON SHORTEST POSSIBLE NOTICE AT OUR YARDS AT
WEST SUPERIOR, WIS., and also at EVERETT, WASH.

PHOTOGRAPH OF 300 FT. BOAT IN DOCK.

Plates and
Material
Always on
Hand to
Repair all
kinds of
Metal
Ships in
Shortest
Time.



Best
Quality
of Oak in
Stock for
Repairing
Wooden
Vessels
of all
Classes.

SIZE OF DOCK

Length, Extreme.....537 feet. Entrance, Top.....55 feet 9 in.
Breadth, Top.....90 " 4 in. Entrance, Bottom.....50 "
Breadth, Bottom.....52 " Depth over Sills.....18 "

LARGEST DRY DOCK ON THE LAKES.

PRICES FOR REPAIRS AND DOCKING
SAME AS AT LOWER LAKE PORTS.

A NUMBER OF PROPELLER WHEELS IN STOCK AT DRY DOCK.

CAPT. SAMUEL W. GOULD,

Ex-Ass't Inspector of Steam Vessels.

265 MARCY AVE., CLEVELAND, O.

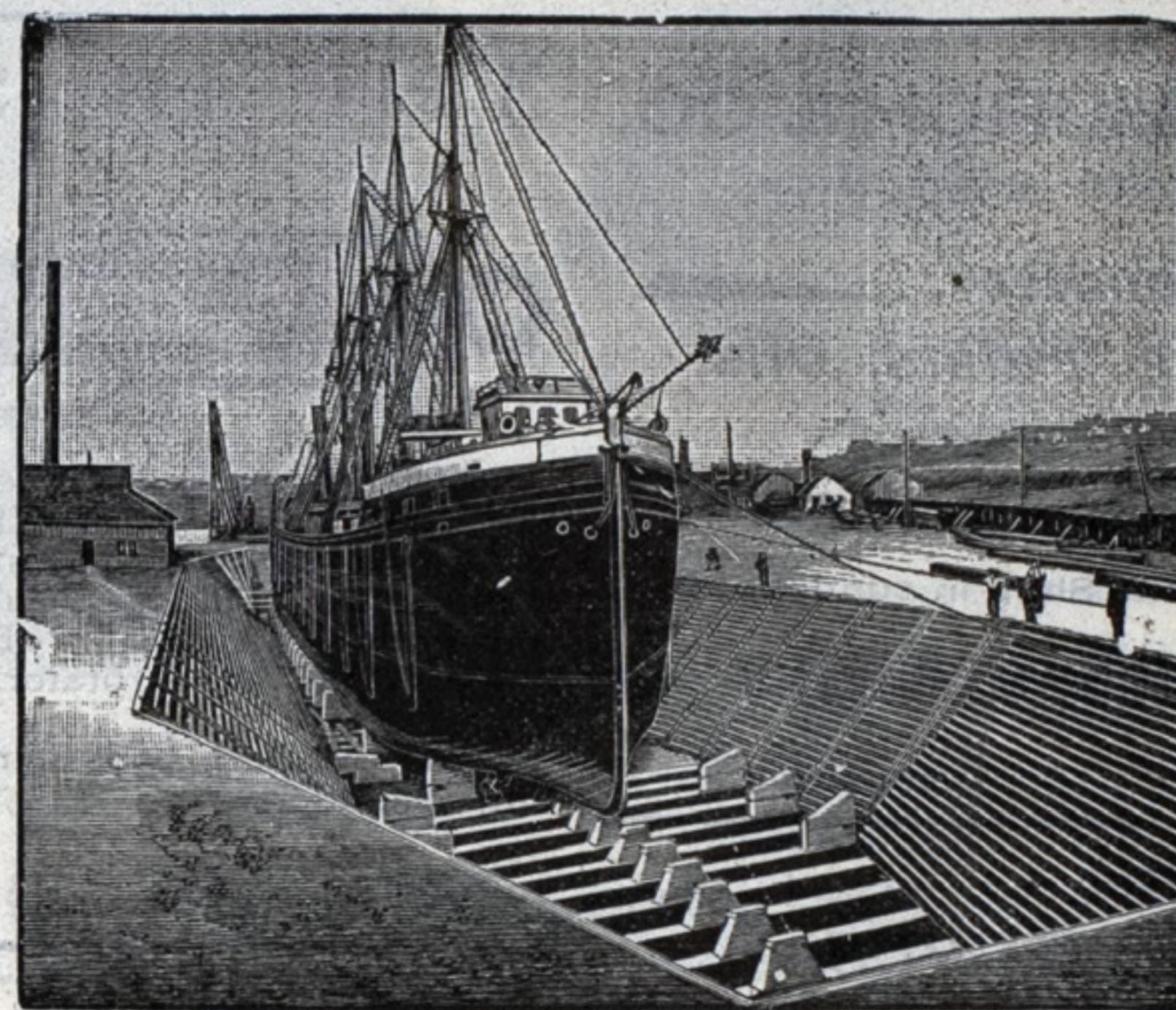
Gives instruction in Navigation and prepares Candidates for the Examinations
for Master and Pilot's Licenses, before the Local Steamboat Inspectors.
Also Instructions given in the Safety Valve and other Problems required by
Candidates for Engineers' License.

TERMS REASONABLE.

TAKE WADE PARK OR PAYNE AVE. CAR.

THE SHIP OWNERS DRY DOCK CO.

Largest
DOCK
YARD
on the
GREAT
LAKES.



Capacity
with
Two Docks
to Dock
the
Largest
Ships on
the Lakes.

GENERAL REPAIR WORK PROMPTLY ATTENDED TO.

Being equipped with Lucigen Lights we can do work at night as well as day.

TELEPHONE 1635. Foot of Weddell St., CLEVELAND, O.

ESTABLISHED 1857.

THOMAS MARKS & CO.,
Merchants, Forwarders and
Ship Owners.
PORT ARTHUR, CANADA.
N. B.—Special attention given
to chartering vessels.

Calvin Carr. G. C. Blair.
John Mitchell.

A. A. Parker. James W. Millen.

B. W. Parker.

PARKER & MILLEN,
Vessel and Insurance Agents.
Iron Ore & Coal Cargoes. Specialty.
Rooms 3 & 4 15 Atwater St., West.
DETROIT, MICH.

C. F. Palmer. H. W. Cook.
Capt. J. A. Calbick.
Palmer, Cook & Calbick,
Vessel Agents and Underwriters,
No. 6 Sherman Street, Chicago, Ill.
Telephone, Main 3952.

J. G. Keith. D. Sullivan.

J. G. KEITH & CO.
VESSEL AND
INSURANCE AGENTS,
140 and 141 Rialto Bldg. CHICAGO.
Telephone No. 3658.

JOHN PRINDIVILLE,
VESSEL AND
INSURANCE AGENT,
15 Sherman Street,
Telephone Main 129. CHICAGO.

C. A. MACDONALD & CO.,

GENERAL MARINE INSURANCE AGENTS.

RIALTO BUILDING,

CHICAGO, ILL.

THOS. WILSON,

MANAGING OWNER WILSON'S TRANSIT LINE.

General Forwarder, Freight and Vessel Agent.

CLEVELAND, O.

C. R. JONES & CO., VESSEL AGENTS

FIRE AND MARINE INSURANCE.

Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

JOHN MITCHELL.

JOHN F. WEDOW.

ALFRED MITCHELL.

MITCHELL & CO., Vessel and Insurance Agents,
Office Telephone, 767.
Residence John Mitchell, 3806.

508-509-510 Perry-Payne Building,

CLEVELAND, O.

United States and Canadian Charts

Of the Lakes and Connecting Rivers are for sale at the office of
THE MARINE RECORD.

Address SMITH & SMITH, 144 Superior St., CLEVELAND, O.